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EFFECTS OF POLLUTION ON AQUATIC LIFE RESOURCES OF THE SOUTH PLATTE RIVER BASIN IN COLORADO. VOLUME II. TECHNICAL APPENDIX

Federal Water Pollution Control Administration
Denver, Colorado

December 1967

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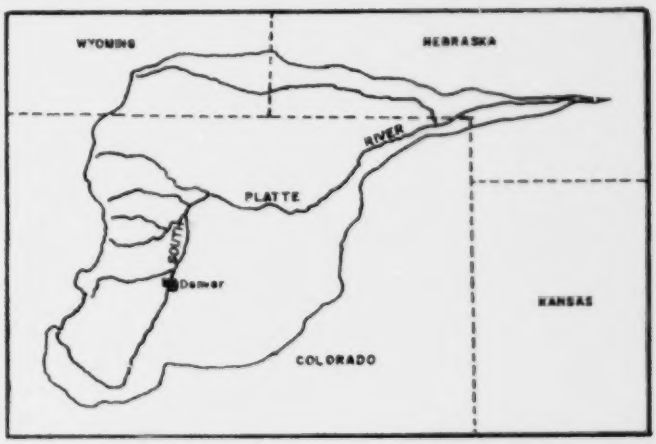
VOLUME II - TECHNICAL APPENDIX



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U.S. DEPARTMENT OF THE INTERIOR
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South Platte River Basin Project
Denver, Colorado
and
Technical Advisory and Investigations Branch
Cincinnati, Ohio
December 1967

EFFECTS OF POLLUTION ON THE AQUATIC LIFE RESOURCES OF THE SOUTH PLATTE RIVER BASIN

Volume II

Technical Appendix

South Platte River Basin Project
Denver, Colorado

and
Technical Advisory and Investigations Branch
Cincinnati, Ohio

Federal Water Pollution Control Administration

United States Department of the Interior

December 1967

FOREWORD

This volume is the technical appendix for biological studies undertaken in the South Platte River Basin during the period from July 1963 through January 1967. It is designed for the professional person who may desire reference to the detailed data contained herein. Evaluation of these data are included in the body of the biological report.

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DESCRIPTION OF SAMPLING STATIONS

Biological sampling stations are designated by river mile (see "SOUTH PLATTE RIVER BASIN RIVER MILEAGE INDEX," Revised, September 1966. U. S. Department of the Interior, Federal Water Pollution Control Administration, South Platte River Basin Project, Denver, Colorado). The biological sampling performed may be divided into four broad categories:

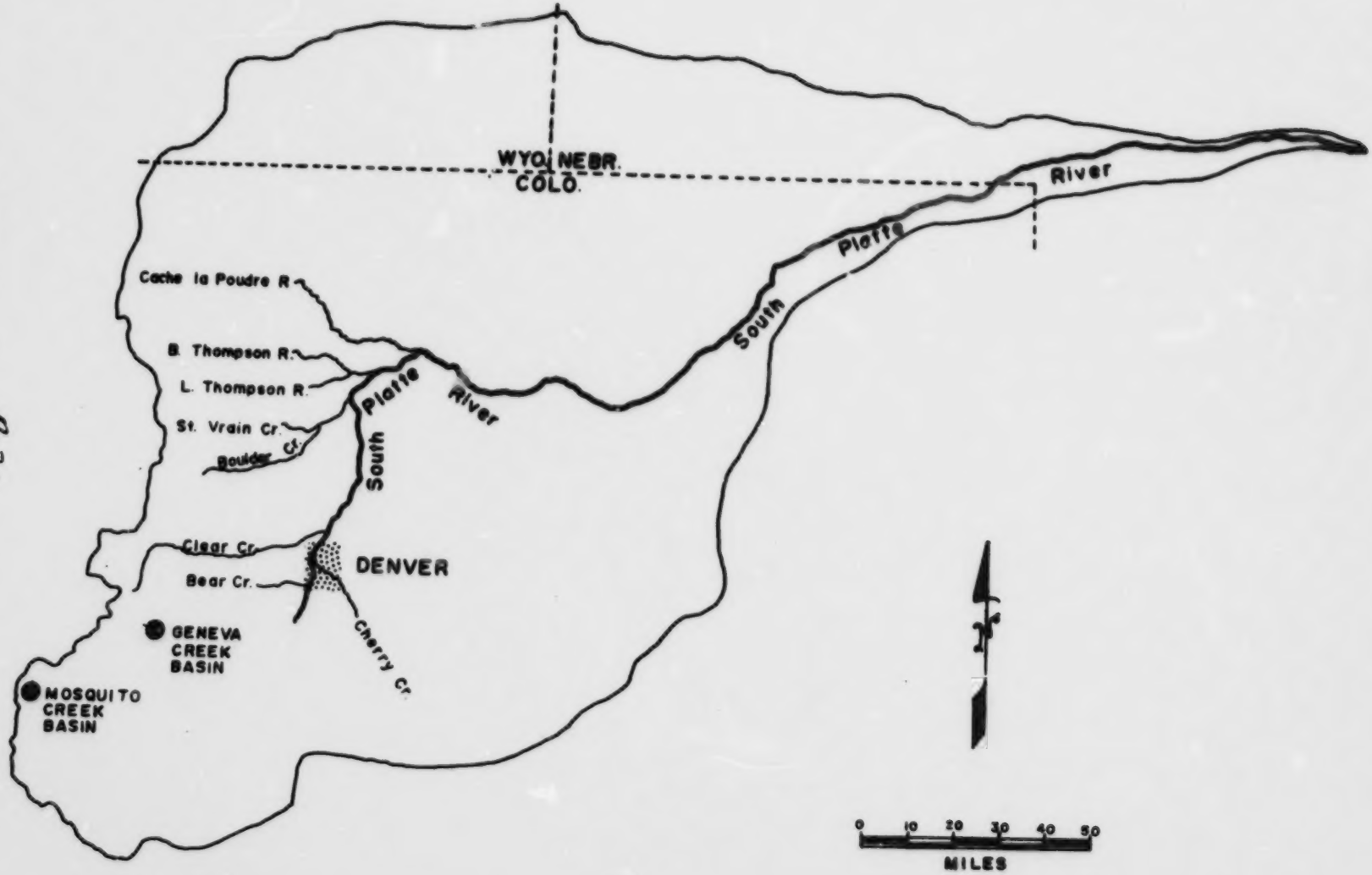
(1) fish

(2) benthos (the bottom-associated animals)

(3) periphyton (attached algae)

(4) plankton (free floating suspended algae)

Following is a tabulation by river mile of biological sampling stations, general description of location, type of samples collected and notations of confluences of major tributaries. Figure A-1 shows the general location of the listed streams or areas.



A-2

FIGURE A-1. LOCATION OF STREAMS SAMPLED DURING BIOLOGICAL INVESTIGATIONS IN THE SOUTH PLATTE RIVER BASIN, COLORADO 1963-1966

SAMPLING STATIONS FOR BIOLOGICAL SAMPLES

SOUTH PLATTE RIVER BASIN

1963 - 1966

River Mile (Station Number)	Location	Type of Sample(s) *
	SOUTH PLATTE RIVER	
81.1	Western Canal Irrigation Diversion	B
83.7	Colorado-Nebraska Stateline	
87.0	Julesburg, South on Colorado Highway 51 (U.S. Hwy. 385)	B
95.4	Ovid, South on Colorado Highway 23	B, C
103.0	Sedgewick, South on County Road	B
120.5	Crook, South on Colorado Highway 25	B, C
141.7	Ford, East on Unmarked Road	B, C
151.6	Sterling, 0.2 Miles South of City on U. S. Highway 6, then 0.7 miles East of U. S. Highway 6 on Unmarked Road, then 0.2 miles South on Farm Lane (Approximately 2 River Miles Upstream from Colorado Highway 14 Bridge Crossing South Platte River East of Sterling)	B, C
158.1	Atwood, South on Colorado Highway 63	B
174.0	Balzac, Sugar-Beet Loading Station, North of U. S. Highway 6 on Unmarked Road to River Crossing	B
178.6	Cooper, Sugar-Beet Loading Station, North of U. S. Highway 6 on Unmarked Road	B
183.4	Snyder, South on Colorado Highway 71	B

Sampling Stations-Continued

River Mile (Station Number)	Location	Type of Sample(s) *
311.1	CLEAR CREEK CONFLUENCE	B
314.3	Franklin Street, Denver	B
314.6	Upstream from Denver Northside Sewage Treatment Plant	B
317.7	CHERRY CREEK CONFLUENCE	
317.8	Between 14th and 15th Street Viaducts, Upstream from Cherry Creek Confluence, Denver	B
	BEAR CREEK CONFLUENCE	
323.9	Florida Avenue, Denver	B
326.4	BEAR CREEK CONFLUENCE	
329.8	Littleton, Bowles Avenue	B
332.3	Littleton, Cooley Sand and Gravel Co.	A, B, C
334.9	Littleton, Peter Kiewit Sand and Gravel Co.	A, B, C
335.2	Blakeland, near Nevada Ditch Diversion	A, B, C
336.5	Blakeland, Blakeland Road (Highway 75)	A, B, C
339.2	Waterton	B

* A - fish; B - benthos; C - periphyton, D - plankton

Sampling Stations-Continued

River Mile (Station Number)	Location	Type of Sample(s) *
	CLEAR CREEK	
0.3	York Street, Denver	B
10.4	North Kipling Street	B
17.9	Two miles **Upstream** from Golden Along U.S. Highway 6	B
26.6	Three miles **Downstream** from North Clear Creek Confluence Along Side U. S. Highway 6	A, B, C
30.0	CONFLUENCE NORTH CLEAR CREEK	
	North Clear Creek Sampled (B,C) 0.1 Mile Above Confluence	
35.7	One Mile Downstream from Idaho Springs Along Abandoned Routing of U. S. Highways 6 and 40	A, B, C
45.1	At Lawson	A, B, C
47.1	CONFLUENCE WEST FORK OF CLEAR CREEK	
48.1	One Mile Below Georgetown Along Side U. S. Highway 6	A, B, C
54.9	Two Miles Upstream from Silver Plume Along Side U. S. Highway 6	A, B, C
	WEST FORK CLEAR CREEK	
5.4	Five Miles West of Empire Along Side U.S. Highway 40	A, B, C

Sampling Stations-Continued

River Mile (Station Number)	Location	Type of Sample(s) *
	BIG THOMPSON RIVER	
1.2	At State Gaging Station Near Elm Beet Loading Station	B, C
7.0	CONFLUENCE LITTLE THOMPSON RIVER	
8.2	Milliken, North on Colorado Highway 257	B, C
16.5	South from Officer One Mile, Then East Half-Mile on Unmarked Road	B, C
37.9	West of Loveland on U. S. Highway 34 to Fawn Hollow	B, C
	LITTLE THOMPSON RIVER	
1.0	Milliken, North on Colorado Highway 257	B, C
9.4	Harts Corner, South on U. S. Highway 87	B, C
	ST. VRAIN CREEK	
1.3	U.S. G.S. Gaging Station, 1 Mile East of Gowanda, on Colorado Highway 60, 4 Miles North on Unmarked Road	B, C
14.6	U. S. Highway 87 Crossing	B, C
26.6	Half-Mile North Longmont Airport	B, C

*A - fish; B - benthos; C - periphyton; D - plankton

Sampling Stations-Continued

River Mile (Station Number)	Location	Type of Sample(s) *
	GENEVA CREEK AND TRIBUTARIES	
13.5	Road Crossing Near Brittanic Mine, and NNW of Geneva Lake	B
12.5	Road Crossing Near Entrance to Stony Point Development Mine	A, B, C
10.3	SMELTER GULCH CONFLUENCE	
9.2	Approximately 1 road Mile Downstream from Smelter Gulch. On North Side of Road is a Cattle Corral Serving as a Terminus for Stock Trail from North	A, B, C
6.9	DUCK CREEK CONFLUENCE	
6.8	At Ford Across Geneva Creek for Trail Leading up Bruno Gulch	B
5.9	BRUNO GULCH CONFLUENCE	
4.3	SCOTT GOMER CONFLUENCE	
4.0	Along Roadside About Half-Mile Below Bridge Crossing Scott Gomer Creek	A, B, C
2.5	Along Roadside at Whiteside Camp Site	A, B, C
0.	CONFLUENCE WITH NORTH FORK SOUTH PLATTE RIVER AT RIVER MILE 39.1	

(Smelter Gulch (A,B), Duck Creek (B) and Scott Gomer (A,B) sampled 0.1 Miles Upstream from Confluence with Geneva Creek. Bruno Gulch (A,B,C) sampled 1.6 Miles Above Confluence with Geneva Creek)

*A - fish; B - benthos; C - periphyton; D - plankton

Sampling Stations-Continued

River Mile (Station Number)	Location	Type of Sample(s) *
	BOULDER CREEK	
23.6	28th Street, Boulder	B
21.0	North 55th St., Boulder	B
19.9	Half-Mile North of Valmont	B
14.2	North of Liggett Along Side of Union Pacific Railroad	B
7.3	Colorado Highway 52 Crossing	B
1.9	One Mile West of Rinn	B

*A - fish; B - benthos; C - periphyton; D - plankton

METHODS AND PROCEDURES

BIOLOGICAL

Algae

Plankton. Samples of plankton bearing water from Barr Lake were collected in liter bottles and preserved by adding formalin to effect a 5% formalin solution in the sample. Counting of plankton was done by direct count (no concentration of sample) of a one milliliter aliquot in a Sedgwick-Rafter Counting Cell (A.P.H.A., et al., 1955).

Plankton from the Cache la Poudre River was sampled and analyzed for chlorophyll as outlined by Creitz and Richards (1955).

Periphyton. Periphyton, or the attached algal growths, was sampled using artificial substrates. Two types of artificial substrates were used.

Prior to 19[illegible], a multiple-plate substrate (Hester and Dendy, 19[illegible]2), Figure A-2, was used for the collection of both bottom animals and periphyton. This substrate was modified with double top-plates. Upon disassembly of the substrate, the uppermost of the two top-plates was placed into a plastic bag and quick-frozen on dry ice for shipment to the laboratory. In the laboratory the plate was scrubbed in water and the algal bearing water was vacuum filtered through Number 1 Whatman filter papers held in Buechner funnels.* The filter paper and retained algal cells

*Laboratory studies revealed that less than one percent of the chlorophyll passed through this system into the filtrate.

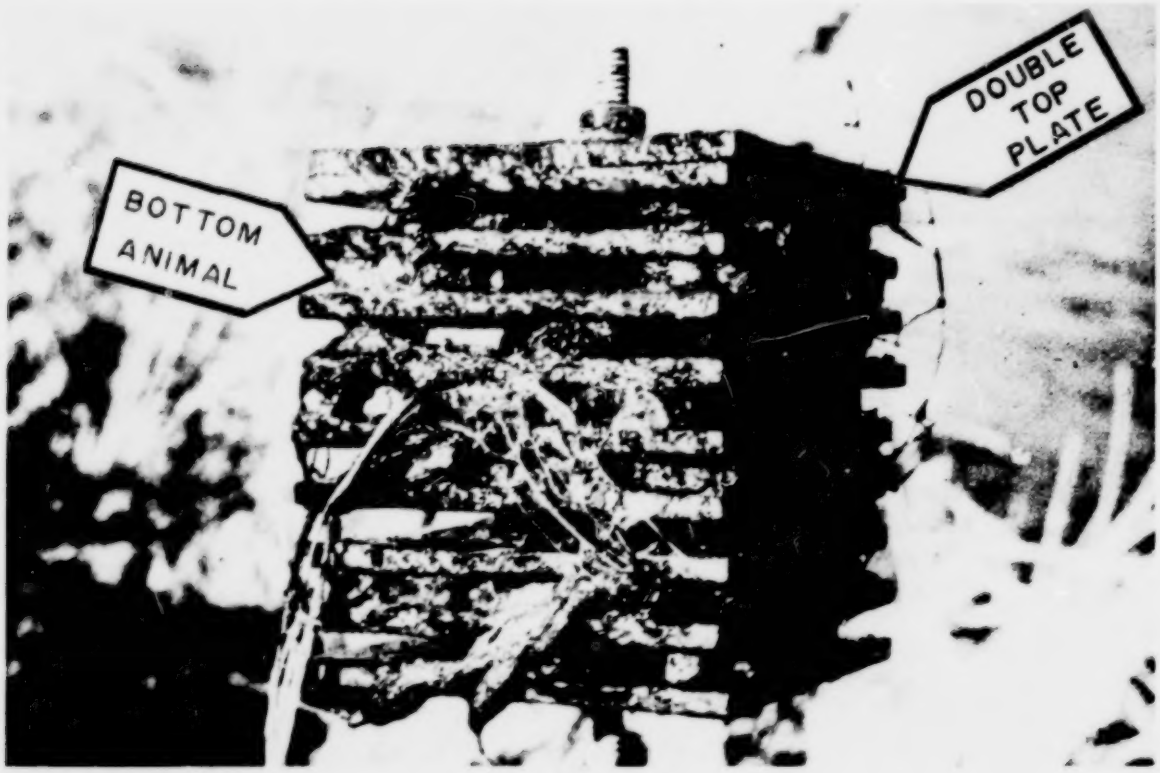


FIGURE A-2

Multiple-plate artificial substrate used for the collection of bottom animals and periphyton growths. The upper of the double plates was used for collecting periphyton (note - film of algal growth covering masonite plate). Bottom animals (a caddisfly) occupy spaces between plates.

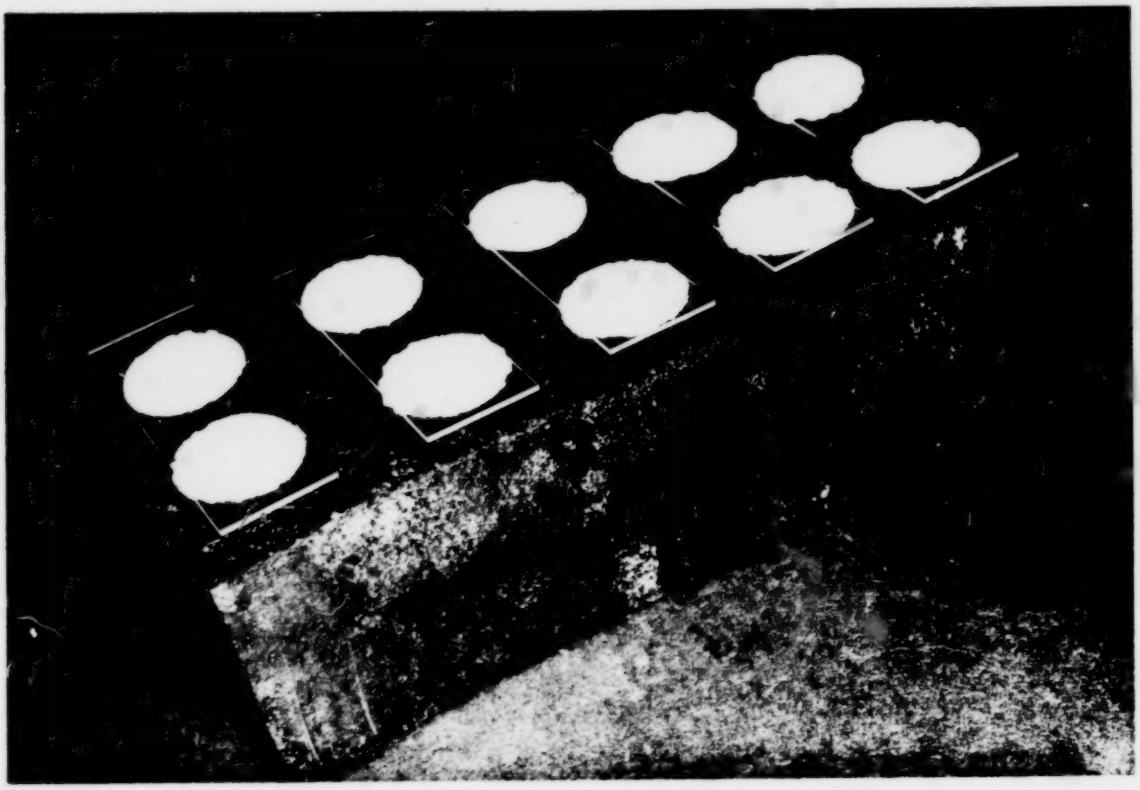


FIGURE A-3

Glass microscope slides and brick assembly used for attached algal (periphyton) sampling in the South Platte River and tributaries.

Modified for expressing chlorophyll on an areal basis from a substrate:

$$\text{chlorophyll } \underline{a} = \frac{C \times S}{A} = \text{micrograms/sq. inch}$$

where:

C. = concentration of chlorophyll in acetone solute (μg/ml.)

S = milliliters of acetone solute

A = square inches of substrate.

Duplicate glass slides were also placed in a 5% formalin solution. In the laboratory the algae remaining attached to the slides were scraped and rinsed off into the formalin solution. The suspension of algal cells was adjusted to a known volume, an aliquot was counted (see plankton), and cells per unit area computed.

Bottom Animals

Quantitative Sampling. Three kinds of quantitative bottom samplers were used. These are described in "Standard Methods" (A.P.H.A., et al., 1965). The square-foot (Surber) bottom sampler was used to collect the majority of the quantitative bottom animal samples. In areas with soft bottoms of sludge or silt, such as in Barr Lake, the Ekman dredge was used. In areas, such as in metropolitan Denver, where the interstitial spaces of rock rubble covering the bottom were filled with sludges, the Petersen dredge was used. All data obtained are expressed as number of animals per square foot of stream bottom.

The collected samples were screened on a No. 30 U. S. Standard Series sieve. Those animals retained on the sieve are considered in this report; in essence, these are visible to the unaided eye.

Qualitative Sampling. To supplement information obtained by dredging, qualitative samples were also collected. In qualitative sampling, animals of kinds other than those obtained in the dredged samples were collected by hand-nets or direct picking from rocks, aquatic vegetation, logs, and other submerged objects. This procedure provided specimens from habitats not readily sampled with quantitative tools; along with specimens that occur infrequently in sampling because of their relative scarcity or poor overall distribution in the area sampled. The data obtained are considered as adjunct to the quantitative information.

Artificial Substrates. Artificial substrates were also used for sampling bottom animal communities. The substrates used were a modification of the multiple-plate sampler described by Hester and Dendy (1962) (Figure A-2). These are constructed from 3 X 3 X 1/8 inch masonite squares separated by spacers of masonite 1 X 1 X 1/4 inch. The masonite is tempered (smooth finished) on both surfaces. This sampler is placed into the stream for several weeks. During this period many types of bottom animals occupy the living space provided by the sampler. This technique eliminates differences between natural stream bottoms that may be found at different sampling stations. The data are expressed as animals per substrate, and are influenced by the length of the period of exposure in the stream, thus only data from equal exposure periods may be directly compared.

Fish

Sampling of fish was undertaken in the Mosquito Creek, Geneva Creek, and Clear Creek basins during the summer of 1966; and in the Cache la Poudre River during both the summer and autumn of 1966.

A small modified trap-net was used for the collection of fish. Figure A-4 illustrates the net used for studies in the South Platte Basin, with the net's pertinent dimensions. The fish data are expressed as the equivalent catch for four days of netting (net-days); for example, one net fished for four days, or two nets fished for two days. Nets were checked and emptied daily. Only data from undisturbed nets are incorporated in the final tabulations. If nets had been molested by humans, or damaged by wildlife, such as muskrats or turtles, the fish remaining in the nets were released without examination.

Table 1. lists synonymous common names and scientific names for the species of fish captured during these studies.

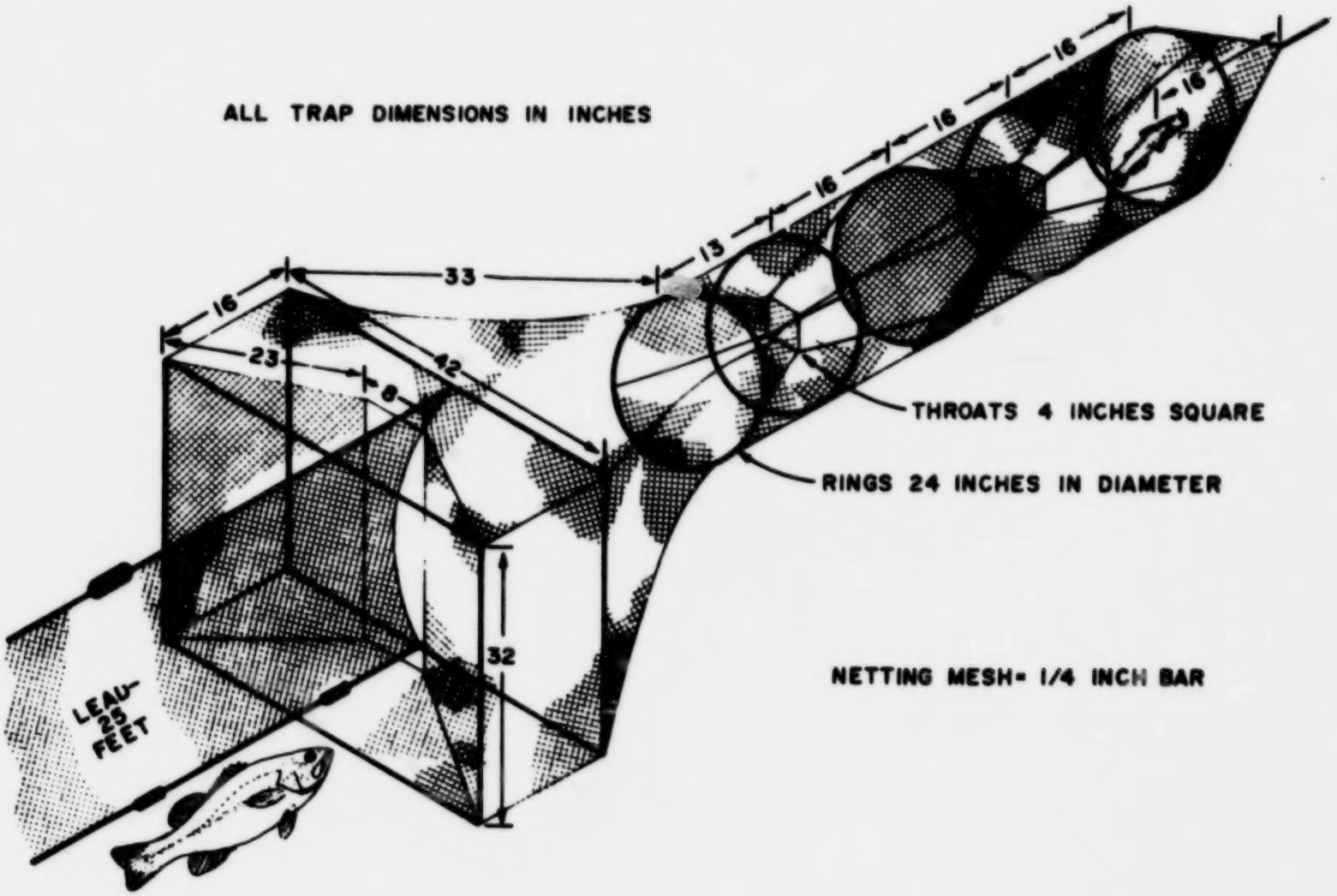


FIGURE A-4. MODIFIED TRAP-NET, WITH PERTINENT DIMENSIONS, USED FOR THE SAMPLING OF FISH IN THE SOUTH PLATTE RIVER BASIN.

CHEMICAL

Analysis for pH, alkalinity, hardness, turbidity, various solids, acidity, dissolved oxygen, and biochemical oxygen demand were performed as outlined in "Standard Methods" (A.P.H.A. et al., 1965).

Nutrients. Prior to 1966, ammonia, nitrate, and organic nitrogen, and total, and soluble phosphorus determinations were performed as outlined in "Standard Methods" (A.P.H.A. et al., 1965).

Beginning in 1966, automation of the laboratory required new or modified techniques to fit the instrumentation. Ammonia-nitrogen, total and soluble phosphorus were determined on a Technicon Autoanalyzer.

The phenolate method with the addition of nitroprusside (Ternberg and Hershey, 1960) was used for ammonia-nitrogen determinations. Organic nitrogen was measured by the Micro-Kjeldahl procedure (Kabat and Mayer, 1948) with preliminary discharge of ammonia-nitrogen at pH 7.4. Nitrate nitrogen was determined manually by the method of Jenkins and Medsker (1964).

The ammonium molybdate-stannous chloride procedure (Kromer and Gale, 1964) was used to determine phosphorus concentrations. Soluble phosphorus was determined by examination of the filtrate, after filtration through a membrane filter of 0.45 millimicron pore size.

All nitrogen (N) and phosphorus (P) data were reported as the quantity of the element; not the ionic state. For example, NO_3 or PO_4, that the element was in during the chemical reaction of the analysis.

Heavy Metals. Heavy metals were determined by atomic absorption using a Perkin-Elmer Model 303 instrument, operated according to the manufacturer's instructions and methodology manual. Lead was also determined by atomic absorption after preliminary sample concentration by extraction on an ion-exchange column and elution with HCl, resulting in a 20:1 concentration factor.

MISCELLANEOUS

Seed Bioassay. A seed bioassay was used to test the effects of sugar beet processing waste waters on seeds of three major crops in the South Platte River Valley. Wastes from processing mills located at Greeley, Eaton, Windsor and Longmont were tested on corn, alfalfa, and sugar beet seeds. Use of the seed bioassay for testing waste waters was reported by Prat and Sladeck (1964).

Seeds were placed in plastic petri dishes with concentrations of wastes ranging from zero (distilled water) to 100%. All dishes were held in the dark at ambient ($75 \pm 3^{\circ}F$) room temperature. The seeds were checked each day for germination and root length. Tests were terminated after five days.

Selection of Toxicity Thresholds for Heavy Metals

To estimate the net toxicity of waters containing a mixture of potentially toxic heavy metals, the method proposed by Herbert, et al (1965) was used. (See: vol. 1, page 58). Use of this method requires the determination or selection of the toxicity threshold (i.e., LD_{50}, TL_M, etc.) for each metal considered individually and without the antagonistic or synergistic effects of other metals that may be present in the considered waterway. The toxicity threshold values used in this study were selected from values determined for fish and reported in the scientific literature. In selecting values particular consideration was given to chemical characteristics, other than heavy metals, of the waterways to which this method was applied.

Chemical data for the following materials indicated that they were not present in quantities that would be expected toxic, or in quantities that would contribute a significant portion to the net toxicity of the waters.

Aluminum

Manganese

Chromium

Molybdenum

Arsenic

Silver

Cyanide

Table 1. LIST OF COMMON NAMES AND SCIENTIFIC NAMES OF FISH CAPTURED IN THE SOUTH PLATTE RIVER BASIN, COLORADO

Common Name Used in this Report, and According to American Fisheries Society [1]	Common Name in "Guide to the Fishes of Colorado" [2]	Scientific Name
Cutthroat trout	Yellowstone cutthroat trout	Salmo clarki Richardson
Rainbow trout	Rainbow trout	Salmo gairdneri Richardson
Brown trout	Brown trout	Salmo trutta Linneaus
Brook trout	Brook trout	Salvelinus fontinalis (Mitchill)
Carp	Carp	Cyprinus carpio Linnaeus
Rio Grande Chub	Rio Grande Chub	Gila nigrescens (Girard)
Brassy minnow	Brassy Minnow	Hybognathus hankinsoni Hubbs
River shiner	River shiner	Notropis blennius (Girard)
Common shiner	Northern common shiner	Notropis cornutus (Mitchill)
Bigmouth shiner	Central, or Western bigmouth shiner	Notropis dorsalis (Agossiz)
Red shiner	Plains red shiner	Notropis lutrensis (Baird and Girard)
Fathead minnow	Fathead minnow	Pimephales promelas Rafinesgue
Longnose dace	Longnose dace	Rhinichthys cataractae (Valenciennes)
Longnose sucker	Western longnose sucker	Catostomus catostomus (Forster)
White sucker	Western white sucker	Catostomus commersoni (Lacepede)
Mountain sucker	Plains mountain-sucker	Pantosteus platyrhynchus (Cope) [3]
Black bullhead	Black bullhead	Ictalurus melas (Rafinesgue)
Green sunfish	Green sunfish	Lepomis cyanellus Rafinesgue
Pumpkinseed	Pumpkinseed	Lepomis gibbosus (Linnaeus)
Black crappie	Black crappie	Pomoxis nigromaculatus (Le Sueur)

1. Anonymous, 1960. A List of Common and Scientific Names of Fishes from the United States and Canada, American Fisheries Society, Special Publication No. 2, 102 pp.
2. Beckman, William C. 1952. A Guide to the Fishes of Colorado, University of Colorado Museum, Boulder, Colorado, 110 p. (Reprinted, 1963).
3. "Guide to the Fishes of Colorado" calls this sucker Pantosteus jordani Evermann, a form that is closely related to P. platyrhynchus (Cope). The American Fisheries Society list does recognize these as distinctly seperable species, thus P. platyrhynchus would be the name in common for both forms based on priority in procedures of scientific nomenclature.

Table 2. Chemical Data, South Platte River
Vicinity of Blakeland and Littleton, Colorado

August 1966

Station Location (River Mile)	Date (August)	pH Units	Alkalinity mg/l	Hardness mg/l	Turbidity Units	Total Dissolved Solids mg/l	Suspended Solids mg/l	Vol. Suspended Solids mg/l
South Platte at	9	7.6	66	91	1.9	164	1?	5.8
Blakeland Road	10	7.5	68	91	4.0	197	2	2.4
(336.5)	11	8.1	60	87	7.3	176	9	2.4
	12	7.7	71	98	8.5	19?	25	2.4
	13	8.1	72	96	6.5	178	12	4.4
Mean		-	67	92	-	181	12	?.4
South Platte at	9	7.6	72	103	52.0	187	78	22.0
Nevada Ditch Diversion	10	7.2	71	10?	64.0	277	104	12.4
(335.2)	11	8.1	69	99	60.0	177	124	15.0
	12	7.3	79	126	27.5	211	100	50.0
	13*	7.2	74	108	9.5	189	2?	5.2
Mean		-	72	108	-	21?	101	24.8
South Platte at	9	7.7	71	10?	24.0	187	70	10.4
Peter Kiewett Sand and	10	7.4	72	104	9.0	224	54	9.2
Gravel	11	8.0	67	97	57.0	176	111	14.0
(334.9)	12	7.6	94	106	27.5	192	72	7.6
	13*	7.4	73	109	10.9	192	20	4.0
Mean		-	76	102	-	195	77	10.?
South Platte at	9	7.7	74	104	4.0	22?	57	10.0
Cooley Sand and Gravel Co.	10	7.9	74	111	42.0	240	4?	6.4
(332.3)	11	8.0	76	115	1.0	212	40	5.2
	12	7.4	84	119	80.0	202	120	14.4
	13*	7.2	76	108	12.6	199	1?	5.6
Mean		-	77	112	-	219	6?	9.0
South Platte at	9	8.0	176	212	780.0	?91	?,?56	188.0
Hall Sand and Gravel	10	7.5	181	216	1,?00.0	2??	?,586	?56.0
Effluent	11	8.2	177	222	910.0	441	2,??8	12.2
(335.9)	12	7.9	182	222	680.0	191	2,8?4	148.0
	13	No Discharge			-			
Mean		-	179	218		?19	?,028	151.0

*Not Used in Computing Mean.

Table 3. SUMMARY OF FISH CAPTURED IN TEST NETS, SOUTH PLATTE RIVER, VICINITY OF BLAKELAND AND LITTLETON, COLORADO, AUGUST, 1966 (TOTAL FOR 4 NET DAYS OR EQUIVALENT) (WEIGHT IN GRAMS)

	Station (River Miles)							
	336.5		335.2		334.9		332.3	
Species	Number	Weight	Number	Weight	Number	Weight	Number	Weight
GAME FISH								
Brown Trout	4	445						
FORAGE FISH								
Green Sunfish	1	10						
Longnose Dace	12	50	16	68	18	85	37	131
Bigmouth Shiner							11	28
Common Shiner							2	12
Rio Grande Chub	208	2780	15	329	9	100	53	483
Fathead Minnow					1	5		
White Sucker	40	4200	1	219	8	408	13	633
Longnose Sucker	4	35	4	295	13	200	8	56
TOTAL	269	7520	36	911	49	798	124	1343

TABLE 4 BOTTOM ANIMALS, SOUTH PLATTE RIVER IN METROPOLITAN DENVER

(FROM WATERTON DOWNSTREAM TO PLATTEVILLE, COLORADO) MAY 1964

(Number per Square Foot)

Station (River Mile) ——→	339.2	329.0	323.9	317.8	314.6	314.3	306.8	301.7	296.1	288.2	276.7
Organism											
Stoneflies (Plecoptera)	4	1	-	-	Not Sampled	No Organisms	-	-	-	-	-
Mayflies (Ephemeroptera)	5	1	2	-			-	-	-	-	-
Caddisflies (Tricoptera)	16	-	-	-			-	-	-	-	-
Snails (Gastropoda)	21	1	-	63			-	-	-	-	-
Black Flies (Simulidae)	1	-	-	-			-	-	-	-	-
Biting Midges (Ceratopogonidae)	-	41	2	-			-	-	-	-	1
Midges (Chironomidae)	23	26	459	-			-	-	-	-	-
Leeches (Hirudinea)	-	-	-	5			-	-	-	-	-
Sludgeworms (Tubificidae)	1	5	306	3094			16	2	2	19	207
Sewage Flies (Psycodidae)	-	-	2	2			2	2	-	2	7
Number of Kinds	7	6	5	4	-	-	2	2	1	2	2
Number per Square Foot	71	75	771	3164	-	-	20	4	2	21	214

TABLE 5 BOTTOM ANIMALS, SOUTH PLATTE RIVER IN METROPOLITAN DENVER,

(FROM WATERTON DOWNSTREAM TO PLATTEVILLE, COLORADO) AUG., 1964

(Number per Square Foot)

Station (River Mile) ——> / Organism	339.2	329.8	323.9	317.8	314.6	314.3	308.3	301.7	296.1	288.2	276.7
Mayflies (Ephemeroptera)	51	9	2	-	-		-	-	-	-	-
Caddisflies (Tricoptera)	2	10	-	-	-		-	-	-	-	-
Riffle Beetles (Elmidae)	2	-	-	-	-		-	-	-	-	-
Crane Flies (Tipulidae)	2	-	-	-	-		-	-	-	-	-
Scuds (Amphipoda)	-	-	289	-	-		-	-	-	-	-
Fingernail Clams (Sphaeriidae)	1	-	-	-	-	NO ORGANISMS	-	-	-	-	-
Dragonflies (Anisoptera)	1	-	3	-	-		-	-	-	-	-
Snails (Gastropoda)	-	-	94	-	-		-	-	-	-	-
Black Flies (Simulidae)	-	2	-	-	-		-	-	-	-	-
Biting Midges (Ceratopogonidae)	-	2	-	-	-		-	-	-	-	-
Midges (Chironomidae)	-	17	15	31	-		-	1	-	-	-
Leeches (Hirudinea)	-	-	117	-	82		1	-	-	-	-
Bloodworms (Chironomidae)	-	-	2	-	-		-	-	-	-	-
Sludgeworms (Tubificidae)	-	14	432	38,100	6,700		1	3	3	61	19,600
Sewage Flies (Psycodidae)	-	1	2	-	-		-	-	-	-	-
Number of Kinds	6	7	9	2	2	-	2	2	2	1	1
Number per Square Foot	59	55	956	38,131	6,782	-	2	4	3	61	19,600

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TABLE 6. BOTTOM ANIMALS, SOUTH PLATTE RIVER, FROM MILLIKEN (HIGHWAY 60) DOWNSTREAM TO WELDONA, COLORADO, 1964 (Number per Sq. Ft.)

Station (River Miles)	Collected in August							Collected in October						
	264.7	252.5	246.5	236.2	224.9	216.8	203.9	264.7	252.5	246.5	236.2	224.9	217.9	203.9
Mayflies (Ephemeroptera)														
Baetis	202	53	-	-	-	1	-	2	-	-	2	-	1	1
Ameletus	90	-	-	-	-	3	-	-	-	-	-	-	-	-
Tricorythodes	-	-	-	-	1	6	1	-	1	-	1	1	1	3
Caddisflies (Tricoptera)														
Hydropsyche	-	-	1	-	1	1	1	-	-	-	-	2	1	1
Agrayles	8	-	-	-	-	10	-	-	-	-	-	-	-	-
Cheumatopsyche	-	-	-	-	-	3	3	-	1	-	-	4	4	2
Blackflies (Simulidae)														
Prosimulium	80	24	1	-	-	6	5	9	1	2	7[illegible]	14[illegible]	[illegible]	[illegible]
Simulium	50	18	3	1	1	13	1	6	1	-	14	14	[illegible]	[illegible]
Cnephia	-	-	-	-	-	-	1	-	-	-	-	4	3	1
Biting Midges (Ceratopogonidae)	-	6	-	6	2	6	2	-	-	-	-	-	-	-
Craneflies (Tipulidae)	-	-	-	-	-	-	-	-	-	-	2	-	1	-
Midges (Chironomidae)														
Chironomus	170	90	50	20	140	50	-	80	190	22	39	21	7	24
Cryptochironomus	70	-	28	8	11	20	-	-	-	-	-	-	-	-
Polypedilum	90	50	30	-	-	40	10	10	28	12	-	10	-	-
Harnischia	20	20	-	-	60	-	2	-	-	-	10	-	-	-
Cricotopus	-	300	60	70	70	33	24	30	80	-	160	90	11	40
Spaniotoma	90	90	-	-	-	-	-	10	-	-	30	40	-	8
Pentaneura	40	-	-	-	-	-	-	-	-	-	-	-	-	-
Scuds (Amphipoda)	-	1	1	-	-	-	-	-	27	1	1	-	-	-
Leeches (Hirudinea)	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Bloodworms (Chironomidae)														
Chironomus	300	11	2	7	-	1	-	12	-	9	3	-	-	-
Sludgeworms (Tubificidae)	228	17	221	15	13	169	33	41	371	110	103	119	-	4
Number of Kinds	13	12	10	8	9	15	11	9	10	6	12	11	10	11
Number per Sq. Ft.	1444	680	396	126	296	368	82	200	701	156	443	450	139	120

TABLE 7. BOTTOM ANIMALS ON ARTIFICIAL SUBSTRATES, SOUTH PLATTE RIVER FROM MILLIKEN (HIGHWAY 60) DOWNSTREAM TO WELDONA, COLORADO, 1964

(Number per Substrate) (42 Days Exposure)

Station (River Miles)	(Recovered in September) 264.7	252.5	246.5	224.9	203.9	(Recovered in October) 264.7	252.5	246.5	224.9	203.9
Mayflies (Ephemeroptera)										
Ameletus	2	-	3	2	1	-				-
Tricorythodes	-	-	-	5	4	-				-
Caddisflies (Tricoptera)										
Agraylea	11	2	8	5	1	-				1
Cheumatopsyche	-	-	-	9	18	-				26
Hydropsyche	-	-	-	11	31	-				31
Damselflies (Zygoptera)										
Ischnura	-	-	-	1	-	-				-
Blackflies (Simulidae)							NO SAMPLES	NO SAMPLES	NO SAMPLES	
Simulium	31	-	1	16	6	-				9
Prosimulium	17	-	1	18	6	-				33
Cnephia	3	-	-	-	-	-				1
Biting Midges (Ceratopogonidae)	-	-	-	-	-	1				-
Midges (Chironomidae)										
Chironomus	7	45	100	63	15	-				9
Spaniotoma		-	8	-	-	-				1
Cricotopus	6	-	43	65	15	1				7
Polypedilum	5	-	7	45	72	-				-
Pentaneura	3	-	-	-	-	-				-
Scuds (Amphipoda)	1	-	-	-	-	-				-
Snails (Gastropoda)	1	3	-	-	-	-				-
Sludgeworms (Tubificidae)	13	3	49	21	11	12				-
Number of Kinds	12	4	10	13	11	3	-	-	-	9
Number per sq. ft.	100	53	221	265	180	14	-	-	-	118

TABLE 8 BOTTOM ANIMALS, SOUTH PLATTE RIVER, FROM FORT MORGAN DOWNSTREAM TO BALZAC, COLORADO

1964

Station (River Miles)	Collected in August					Collected in October				
	197.3	190.0	183.4	178.6	174.0	197.3	190.0	183.4	178.6	174.0
Mayflies (Ephemeroptera)										
Ameletus	4	-	-	1	-	-	-	-	-	-
Tricorythodes	24	33	2	5	-	-	-	-	-	-
Baetis	4									
Callibaetis	-	11	-	-	-	-	-	-	-	-
Caddisflies (Trichoptera)										
Hydropsyche	8	-	-	14	-	8	-	3	2	2
Cheumatopsyche	-	2	-	-	-	-	-	-	-	-
Agraylea	2	2	-	-	-	1	-	-	-	-
Dragonflies (Anisoptera)										
Ophiogomphus	-	-	1	-	-	-	-	-	-	-
Damselflies (Zygoptera)										
Ischnura	-	-	-	-	-	2	-	-	2	-
Blackflies (Simuliidae)										
Simulium	7	1	-	4	-	36	48	4	2	2
Prosimulium	1	-	-	1	-	18	42	3	5	1
Cnephia	-	-	-	1	-	2	5	-	-	-
Biting Midges (Ceratopogonidae)										
Bezzia	-	-	1	-	-	-	-	-	-	-
Scuds (Amphipods)	-	2	1	4	-	-	-	-	2	-
Midges (Chironomidae)										
Polypedilum	52	20	10	25	-	23	-	-	-	-
Cricotopus	120	40	40	18		40	100	19	30	12
Chironomus	-	10	10	15	-	10	-	-	5	2
Spaniotoma	30	8	8	-	-	12	47	6	27	10
Pentaneura	5	-	-	-	-	-	-	-	-	-
Cryptochironomus	25	-	6	-	-	-	-	-	-	-
Cardiocladius	-	-	-	-	-	1	-	-	-	-
Scuds (Amphipods)	-	2	1	-	-	-	-	-	2	-
Bloodworms (Chironomidae)										
Chironomus	-	-	10	8	-	1	-	-	-	-
Sludgeworms (Tubificidae)	-	-	1	3	-	-	9	-	-	-
Number of Kinds	12	11	12	12		12	6	5	9	6
Number per Square Foot	288	137	91	96		159	251	33	74	29

2 = Organisms Not Collected Quantitatively; Arbitrarily Given Value of 1 for Computing.

TABLE 9. BOTTOM ANIMALS ON ARTIFICIAL SUBSTRATES

SOUTH PLATTE RIVER AT FORT MORGAN AND DODD BRIDGE, COLORADO, 196[illegible]

(Number per Substrate) (42 Days Exposure)

Station (River Miles)	Recovered in September 196.3	Recovered in September 190.0	Recovered in October 196.3	Recovered in October 190.0
Mayflies (Ephemeroptera)				
Caenis	1	1	-	-
Ameletus	2	6	-	-
Cinygma	-	1	-	-
Caddisflies (Tricoptera)				
Cheumatopsyche	1	2	1	-
Arctopsyche	-	1	-	-
Hydropsyche	1	1	-	-
Dragonflies (Anisoptera)				
Ophiogomphus	-	-	1	-
Damselflies (Zygoptera)				
Ischnura	-	1	-	-
Blackflies (Simulidae)				
Simulium	3	1[illegible]	6	13
Prosimulium	2	10	11	14
Cnephia	1	2	-	-
Midges (Chironomidae)				
Polypedilum	2	36	-	-
Cricotopus	1	16	1	9
Spaniotoma	1	4	1	3
Chironomus	-	3	7	-
Sludgeworms (Tubificidae)	1	1	1	1
Number of Kinds	11	15	8	5
Number per Substrate	16	103	29	40

TABLE 10 QUANTITIES OF CHLOROPHYLL EXTRACTED FROM ALGAL GROWTHS ATTACHED TO ARTIFICIAL SUBSTRATES, SOUTH PLATTE RIVER, COLORADO, 1964

(42 days substrate exposure)

(micrograms per square inch)

Station (River Mile)	Recovered in September	Recovered in October
264.7	162	15
252.5	179	N.S.
246.5	670	N.S.
224.9	207	N.S.
216.8	154	47
196.3	102	71
190.0	129	110

N.S. = Not Sampled

TABLE 11.

BOTTOM ANIMALS, SOUTH PLATTE RIVER, FROM ATWOOD, COLORADO, DOWNSTREAM TO NEBRASKA, 1963

(Number per Square Foot)

Station (River Miles) →	Collected in September								Collected in November							
	158.1	151.6	151.7	148.5	103.0	95.4	87.0	81.1	158.1	151.6	151.7	148.5	103.0	95.4	87.0	81.0
MAYFLIES (EPHEMEROPTERA)																
Hexagenia	-	-	-	-	-	-	-	-	-	-		-	-	4	-	
Pseudocloeon	-	-	1	-	-	-	1	-	1	1		-	-	-	-	
Amelotus	1	-	1	1	1	-	8	-	-	-		-	-	-	-	
Caenis	5	4	2	6	58	1027	32	1	1	-		-	2	4	13	
Tricorythodes	-	-	-	-	-	28	-	-	-	-		-	-	-	-	
CADDISFLIES (TRICOPTERA)																
Hydropsyche	-	-	-	-	-	-	-	-	-	1		-	-	-	-	
Cheumatopsyche	5	-	-	-	9	-	1	-	-	-		-	-	-	-	
Agraylea	-	-	-	1	-	-	-	-	-	-		-	-	-	-	
CRANE FLIES (TIPULIDAE)	-	-	-	-	1	-	1	-	-	-		1	-	-	-	
DRAGONFLIES (ANISOPTERA)																
Gomphus	-	-	-	1	-	1	1	-	-	-		-	-	-	-	
Ophiogomphus	-	-	-	-	1	-	-	-	-	-		-	-	-	-	
Progomphus	-	-	-	-	-	-	-	-	-	-		-	-	4	1	
DAMSELFLIES (ZYGOPTERA)																
Lestes	-	-	1	-	-	-	-	-	-	-		-	-	-	-	
Ischnura	-	-	-	-	-	-	-	-	-	-		1	-	-	-	
BLACK FLIES (SIMULIDAE)											[illegible]					[illegible]
Simulium	1	-	2	-	-	1	-	-	11	1		1	-	-	-	
Prosimulium	-	-	-	-	-	-	-	-	-	-	[illegible]	1	2	-	-	[illegible]
BEETLES (COLEOPTERA)	2	2	-	1	-	-	-	-	-	-		-	1	-	-	
LONG-LEGGED FLIES (DOLICHOPODIDAE)	-	1	-	-	-	-	-	-	-	-		2	-	4	27	
BITING MIDGES (CERATOPOGONIDAE)	1	-	-	-	-	-	-	4	-	-		-	-	-	-	
HOUSE FLIES (MUSCIDAE)	-	-	-	1	-	-	-	-	-	1		-	-	-	-	
MIDGES (CHIRONOMIDAE)																
Chironomus	6	2	10	-	9	520	100	-	4	-		-	3	40	4	
Cricotopus	-	-	-	30	80	-	80	2	2	8		-	-	-	12	
Polypedilum	-	-	2	-	80	-	40	2	-	-		-	-	50	-	
Pentaneura	-	-	-	-	-	-	22	-	-	-		-	1	-	-	
Harnischia	-	-	3	-	25	-	-	-	-	4		22	-	30	-	
Spaniotoma	-	-	7	10	15	-	-	-	6	9		-	-	-	4	
Cryptochironomus	-	-	-	20	-	-	-	2	-	-		-	-	-	-	
Brillia	-	-	-	-	-	-	-	-	3	-		-	-	-	-	
Calopsectra	-	-	-	-	-	-	-	-	2	-		-	-	-	-	
SCUDS (AMPHIPODA)	-	-	-	-	2	-	-	-	1	-		1	-	-	-	
SLUDGEWORMS (TUBIFICIDAE)	-	1	14	8	30	16	7	7	2	1		17	1	44	89	
Number of Kinds	7	5	10	10	12	6	11	6	10	8	0	8	6	8	7	
Number Per Square Foot	21	10	43	82	193	1593	893	18	33	26	0	46	11	180	90	

TABLE 12.

BOTTOM ANIMALS ON ARTIFICIAL SUBSTRATES,
SOUTH PLATTE RIVER, FROM STERLING TO OVID, COLORADO, 1963

(Number per Substrate) (49 Days Exposure)

Station (River Miles) →	Recovered in September				Recovered in November			
	151.6	141.7	120.5	95.4	151.6	141.7	120.5	95.4
MAYFLIES (EPHEMEROPTERA)								
Caenis	-	-	8	20	-	-	2	45
Tricorythodes	1	25	43	25	-	-	3	46
Baetis	-	1	3	1	-	-	-	-
Ameletus	-	1	2	1	2	-	-	1
Heptagenia	-	1	-	-	-	-	-	-
Hexagenia	-	-	-	-	-	-	-	1
CADDISFLIES (TRICOPTERA)								
Hydropsyche	1	5	29	-	-	-	1	3
Agraylea	-	1	-	-	-	-	-	-
Brachycentrus	-	-	-	1	-	-	-	-
Cheumatopsyche	2	1	185	-	2	-	1	13
DRAGONFLIES (ANISOPTERA)								
Ophiogomphus	-	1	1	-	-	1	-	1
DAMSELFLIES (ZYGOPTERA)								
Ischnura	-	2	11	9	-	1	1	2
BLACK FLIES (SIMULIDAE)								
Simulium	-	4	7	-	84	1	3	8
Prosimulium	-	3	4	-	72	1	15	12
Cnephia	-	-	-	-	3	-	-	-
MIDGES (CHIRONOMIDAE)								
Chironomus	6	31	5	31	8	4	-	1
Pseudochironomus	1	-	-	1	-	-	-	-
Cricotopus	1	38	6	4	25	1	3	-
Spaniotoma	-	4	-	-	15	-	3	1
Pentaneura	-	6	6	1	-	-	-	1
Polypedilum	1	4	12	4	-	-	1	9
Cryptochironimus	-	1	-	-	-	-	-	-
SCUDS (AMPHIPODA)	-	3	-	1	1	1	1	3
SOWBUGS (ISOPODA)	-	-	1	-	-	-	-	-
SNAILS (GASTROPODA)	-	8	1	13	-	-	-	4
LEECHES (HIRUDINEA)	-	-	1	-	-	-	-	-
BLOODWORMS (CHIRONOMIDAE)								
Chironomus	-	-	-	-	-	1	-	-
SLUDGEWORMS (TUBIFICIDAE)	-	1	1	-	-	3	2	-
Number of Kinds	7	20	18	13	9	9	12	16
Number per Substrate	13	141	326	112	212	14	36	150

TABLE 17. QUANTITIES OF CHLOROPHYLL EXTRACTED FROM ALGAL GROWTHS ATTACHED TO ARTIFICIAL SUBSTRATES, SOUTH PLATTE RIVER, 1963

(49 days substrate exposure)

(micrograms per square inch)

Station (River Mile)	Recovered in September	Recovered in November
151.6	44	141
141.7	42	21
120.5	40	6
95.4	34	100

TABLE 14. NUMERICAL SUMMARY OF PLANKTON ANALYSES

BARR LAKE, COLORADO, 1964

DATE AND STATION	Number Per Milliliter	PERCENT COMPOSITION			
		Blue-green Algae	Green Algae	Diatoms	Miscellaneous
April 23					
512	4,440	63	12	12	13
513	8,324	45	18	27	10
514	6,600	91	3	3	3
Mean	6.454	66	11	14	9
May 21					
512	1.214.000	99	-	-	1
513	512,000	99	-	-	1
514	649.000	99	-	-	1
Mean	791.600	99			1
June 7					
512	25,000	30	66	4	-
513	12.200	37	62	1	1
514	-	-	-	-	-
Mean	18,600	33	64	2	1
June 18					
512	no sample	-	-	-	-
513	38.850	26	70	4	-
514	33,800	30	66	3	1
Mean	36.300	28	68	3	1
July 16					
512	station dry	-	-	-	-
513	15.540	18	68	7	7
514	no sample	-	-	-	-
Mean	15,540	18	68	7	7
August 6					
512	station dry	-	-	-	-
513	no sample	-	-	-	-
514	46,065	10	86	3	1
Mean	46,065	10	86	3	1

TABLE 15 BOTTOM ANIMALS, BEAR CREEK FROM MORRISON DOWNSTREAM TO CONFLUENCE WITH SOUTH PLATTE RIVER, 1964

(Number per Square Foot)

	Collected in May			Collected in August		
Station (River Mile) ——>	13.0	5.9	0.7	13.0	5.9	0.7
Organisms						
Stoneflies (Plecoptera)	1	-	-	1	-	-
Mayflies (Ephemeroptera)	22	423	77	9	16	6
Caddisflies (Tricoptera)	59	9	-	17	35	-
Riffle Beetles (Elmidae)	44	15	-	22	5	-
Crane Flies (Tipulidae)	19	-	-	-	-	-
Snipe Flies (Rhagionidae)	3	-	-	4	-	-
Scuds (Amphipoda)	-	-	2	-	-	-
Fingernail Clams (Sphaeriidae)	-	3	5	-	-	6
Dragonflies (Anisoptera)	1	-	1	-	-	1
Snails (Gastropoda)	-	3	15	-	1	28
Bee Flies (Syrphidae)	-	39	2	-	-	3
Black Flies (Simulidae)	1	267	1	1	4	1
Biting Midges (Ceratopogonidae)	-	14	-	-	-	-
Midges (Chironomidae)	43	1015	38	3	-	-
Leeches (Hirudinea)	-	-	7	-	1	4
Sludgeworms (Tubificidae)	1	5	65	-	1	-
Number of Kinds	10	10	10	7	7	7
Number per Square Foot	194	1793	213	57	63	49

TABLE 16. BOTTOM ANIMALS, CLEAR CREEK FROM GOLDEN, COLORADO, DOWNSTREAM TO CONFLUENCE WITH SOUTH PLATTE RIVER, 1964

(Number per Square Foot)

Station (River Mile) ——————>	Collected in May			Collected in August		
	17.9	10.4	0.3	17.9	10.4	0.3
Organisms						
Stoneflies (Plecoptera)	1	-	-	-	-	-
Mayflies (Ephemeroptera)	2	1	-	8	14	-
Caddisflies (Tricoptera)	4	1	-	3	-	-
Riffle Beetles (Elmidae)	1	-	-	1	1	-
Snails (Gastropoda)	-	16	-	-	-	-
Scuds (Amphipoda)	-	-	-	-	-	2
Midges (Chironomidae)	7	9	1	6	56	14
Leeches (Hirudinea)	-	80	-	-	-	-
Bloodworms (Chironomidae)	-	-	-	-	1	5
Sludgeworms (Tubificidae)	-	10413	533	-	153	58
Sewage Flies (Psycodidae)	-	8	-	-	3	-
Number of Kinds	5	7	2	4	6	4
Number per Square Foot	15	10528	534	18	228	79

TABLE 17 BOTTOM ANIMALS, CHERRY CREEK, COLORADO, 1964

(Number per Square Foot)

Station (River Mile) ⟶	Collected in May		Collected in August	
	4.2	0.1	4.2	0.1
Organism				
Dragonflies (Anisoptera)	1	-	-	-
Snails (Gastropoda)	14	49	2	5
Fingernail Clams (Sphaeriidae)	-	-	2	-
Midges (Chironomidae)	-	-	12	-
Leeches (Hirudinea)	-	-	4	-
Sludgeworms (Tubificidae)	3601	2683	112	110
Number of Kinds	3	2	5	2
Number per Square Foot	3616	2732	132	115

TABLE 18. BOTTOM ANIMALS, BOULDER CREEK FROM BOULDER, COLORADO, DOWNSTREAM TO ST. VRAIN CREEK, AUGUST 1960

(Number per square foot)

Station (River Mile)	23.6	21.0	19.2	11.2	7.3	1.9
Stoneflies (Plecoptera)						
Brachyptera	Q	-	-	-	-	-
Mayflies (Ephemeroptera)						
Ephemerella	50	-	-	1	-	-
Pseudocloeon	7	1	-	22	100	-
Tricorythodes	18	-	-	12	100	1
Cinygmula	4	-	-	-	-	-
Baetis	4	-	-	13	180	107
Cinygma	1	-	-	1	-	-
Amelotus	-	-	-	1	24	-
Blasturus	-	-	-	1	-	-
Ametropus	-	-	-	-	-	3
Caddisflies (Trichoptera)						
Hydropsyche	Q	-	-	4	-	-
Agrayles	-	-	-	-	392	-
Riffle Beetles (Elmidae)						
Optioservus	C	1	-	-	-	-
Blackflies (Simulidae)						
Simulium	Q	-	-	105	1400	-
Prosimulium	Q	-	-	42	2044	5
Biting Midges (Ceratopogonidae)						
Bezzia	1	-	-	-	-	-
Midges (Chironomidae)						
Pseudochironomus	-	-	-	-	-	2
Polypedilum	23	11	-	-	-	-
Spaniotoma	327	30	-	23	48	-
Cricotopus	233	-	-	7	40	-
Pentaneura	-	-	-	-	20	-
Chironomus	-	-	-	-	-	5
Scuds (Amphipoda)	-	-	-	5	60	107
Aquatic Moths (Lepidoptera)	-	-	1	-	-	1
Sowbugs (Isopoda)	2	-	-	2	4	-
Snails (Gastropoda)	22	-	1	10	120	20
Leeches (Hirudinea)	7	1	-	8	4	2
Bloodworms (Chironomidae)						
Chironomus	-	121	52	-	-	-
Sewage Flies (Psychoda)	-	-	1	-	-	-
Sludgeworms (Tubificidae)	49	8	2	4	24	8
Number of Kinds	19	7	5	17	15	11
Number per square foot	758	172	57	278	4560	278

Q = Organisms Not Collected Quantitatively; arbitrarily given value of 1 for computing.

TABLE 19.

BOTTOM ORGANISMS, ST. VRAINS CREEK, COLORADO, 1964

Station (River Miles) ——>	Collected in August 26.6	14.6	1.3	Collected in October 26.6	14.4	1.3
MAYFLIES (EPHEMEROPTERA)						
Ameletus	14	4	-	-	-	-
Baetis	24	5	-	4	-	-
Trichorythodes	84	15	-	39	-	-
Caenis	4	-	-	-	-	-
Choroterpes	14	-	-	-	-	-
CADDISFLIES (TRICOPTERA)						
Cheumatopsyche	24	-	-	2	-	-
Hydropsyche	1	-	-	-	-	-
Brachycentrus	9	-	-	-	-	-
Agraylea	4	-	-	-	-	-
Heliopsyche	49	-	-	-	-	-
RIFFLE BEETLES (ELMIDAE)	2	-	-	-	-	-
CRANEFLIES (TIPULIDAE)	1	-	-	-	-	-
DRAGONFLIES (ANISOPTERA)						
Ophiogomphus	-	-	1	6	-	-
DAMSELFLIES (ZYGOPTERA)						
Ischnura	-	-	-	Q	-	-
BLACK FLIES (SIMULIDAE)						
Prosimulium	-	14	56	1	-	-
Simulium	-	8	32	-	-	-
Cnephia	-	1	-	-	-	-
BITING MIDGES (CERATAPOGONIDAE)	11	4	-	-	1	-
MIDGES (CHIRONOMIDAE)						
Pelopia	9	-	-	-	-	-
Chironomus	-	94	60	-	-	-
Cardiocladius	-	14	10	-	-	-
Spaniotoma	2	-	-	-	-	-
Cricotopus	-	20	64	-	-	-
Cryptochironomus	-	80	60	-	-	-
Polypedilum	-	108	30	-	-	-
SCUDS (AMPHIPODA)	-	19	1	15	-	-
SNAILS (GASTROPODA)	38	4	-	2	-	-
LEECHES (HIRUDINEA)	1	-	-	-	-	-
BLOODWORMS (CHIRONOMIDAE)						
Chironomus	-	20	-	-	2	47
SLUDGEWORMS (TUBIFICIDAE)	-	5	408	6	113	128
Number of Kinds	17	16	10	9	3	2
Number Per Square Foot	291	415	722	76	116	175

Q = Organisms not collected quantitatively; arbitrarily given value of one for computing.

TABLE 20.

BOTTOM ORGANISMS ON ARTIFICIAL SUBSTRATES,
ST. VRAINS CREEK, 1964

(Number per Substrate) (42 Days Exposure)

Station (River Miles) ——>	Recovered in September			Recovered in October		
	26.6	14.6	1.3	26.6	14.6	1.3
MAYFLIES (EPHEMEROPTERA)						
Baetis	1	-	1	6	-	-
Trichorythodes	3	-	2	17	1	-
CADDISFLIES (TRICOPTERA)						
Cheumatopsyche	45	-	-	2	-	-
Hydropsyche	1	-	-	-	-	-
Heliopsyche	12	-	-	41	-	-
Brachycentrus	2	-	-	1	-	-
Agraylea	-	-	6	-	-	-
DAMSELFLIES (ZYGOPTERA)						
Ischnura	-	-	1	-	-	-
DRAGONFLIES (ANISOPTERA)						
Ophiogomphus	-	-	1	-	-	-
BLACK FLIES (SIMULIDAE)						
Prosimulium	-	5	31	-	-	-
Simulium	-	-	9	-	-	-
SCUDS (AMPHIPODA)	-	-	-	1	-	-
SNAILS (GASTROPODA)	2	1	1	-	-	-
LIMPETS (FERRESIA)	1	-	-	-	-	-
BITING MIDGES (CERATAPOGORIDAE)	2	-	-	-	-	-
MIDGES (CHIRONOMIDAE)						
Cricotopus	1	5	29	-	-	-
Polypedilum	3	14	25	-	-	-
Chironomus	-	5	28	-	-	-
Pentaneura	-	1	7	-	-	-
Calopsectra	-	-	-	-	-	9
LEECHES (HIRUDINAE)	-	2	-	-	-	-
BLOODWORMS (CHIRONOMIDAE)	-	-	-	-	-	5
SLUDGEWORMS (TUBIFICIDAE)	-	5	16	-	19	10
Number of Kinds	11	8	13	6	2	3
Number of Organisms per Artificial Substrate	73	38	157	68	20	24

TABLE 21. QUANTITIES OF CHLOROPHYLL EXTRACTED FROM ALGAL GROWTHS ATTACHED TO ARTIFICIAL SUBSTRATES, ST. VRAIN CREEK, BIG AND LITTLE THOMPSON RIVERS, 1964

(42 day substrate exposure)

(micrograms per square inch)

Station (River Mile)	Recovered in September	Recovered in October
	St. Vrain Creek	
26.6	8	9
14.6	65	29
1.3	74	65
	Big Thompson River	
37.9	13	5
16.5	59	25
8.2	35	88
	Little Thompson River	
9.4	89	61
1.0	6	0

TABLE 22.

BOTTOM ANIMAL , BIG THOMPSON RIVER, COLORADO. 1964

(Number per Square Foot)

	August 1964				October 1964			
	Station (River Mile)				Station (River Mile)			
	27.5	16.5	8.2	1.2	27.5	16.5	8.2	1.2
STONEFLIES (PLECOPTERA)								
Isoperla	1	-	-	-	2	-	-	-
MAYFLIES (EPHEMEROPTERA)								
Baetis	20	-	1	-	2	-	-	1
Ephemerella	12	-	-	-	2	-	-	-
Heptagenia	12	-	-	-	2	-	-	-
Paraleptus	20	-	-	-	6	-	-	-
Trichorythodes	-	-	-	-	4	-	-	-
CADDISFLIES (TRICOPTERA)								
Macronemum	1	3	-	-	3	-	-	-
Heliopsyche	1	-	-	-	1	-	-	-
Glossoma	3	-	-	-	-	-	-	-
Brachycentrus	21	-	-	-	8	-	-	-
Leptocella	-	-	-	-	-	-	-	-
Hydropsyche	-	-	-	-	-	-	-	-
Cheumatopsyche	1	-	-	-	-	-	-	-
Arctopsyche	2	-	-	-	-	-	-	-
RIFFLE BEETLES (ELMIDAE)	Q							
DRAGONFLIES (ANISOPTERA)								
Ophiogomphus	-	1	-	-	-	-	-	-
BLACKFLIES (SIMULIDAE)								
Cnephia	-	-	-	-	-	-	16	-
Prosimulium	6	2	1	-	-	-	304	-
Simulium	3	1	2	-	1	-	86	-
SCUDS (AMPHIPODA)	Q	22	2	-	Q	-	36	1
SOWBUGS (ASELLUS)	-	-	-	-	1	-	-	-
MIDGES (CHIRONOMIDAE)								
Polypedilum	25	60	-	-	-	-	-	-
Cardiocladius	110	-	-	-	-	-	-	-
Chironomus	4	-	-	-	-	1	20	14
Pentaneura	20	4	-	-	-	-	4	-
Cricotopus	-	5	-	-	-	-	70	-
Cryptochironomus	-	4	12	-	-	-	10	-
Pelopia	-	-	5	-	-	-	-	-
Spaniotoma	-	-	-	-	2	-	12	-
LEECHES (HIRUDINEA)	Q	3	-	-	-	-	-	-
SNAILS (GASTROPODA)	-	92	4	-	-	-	-	-
BLOODWORMS (CHIRONOMIDAE)								
Chironomus	-	-	30	8	-	-	26	4
SLUDGEWORMS (TUBIFICIDAE)	1	6	15	4800	2	1	84	876
Number of Kinds	21	12	9	1	14	2	11	5
Number Per Square Foot	328	203	72	4800	44	2	668	896

Q = Organisms not collected quantitatively, arbitrarily given value of one for computing.

TABLE 23.

BOTTOM ORGANISMS ON ARTIFICIAL SUBSTRATES, BIG THOMPSON RIVER, COLORADO, 1964

(Number per Substrate) (42 Days Exposure)

Station (River Miles) ——>	Recovered in September			Recovered in October		
	37.9	16.5	8.2	37.9	16.5	8.2
STONEFLIES (PLECOPTERA)						
Isoperla	-	-	-	1		-
MAYFLIES (EPHEMEROPTERA)						
Baetis	5	-	-	4		-
Trichorythodes	1	-	-	1		-
Ephemerella	7	-	-	1		-
Heptagenia	4	-	-	1		-
Ameletus	1	-	-	1		-
Paraleptophlebia	1	-	-	-		-
CADDISFLIES (TRICOPTERA)						
Brachycentrus	4	-	-	17		-
Macronema	51	-	-	3		-
Cheumatopsyche	5	-	-	1		-
SCUDS (AMPHIPODA)	-	-	16	-		213
BITING MIDGES (CERATAPOGONIDAE)						
Bezzia	-	2	3	-		7
BLACK FLIES (SIMULIDAE)						
Prosimulium	-	-	3	1		1
Simulium	-	-	1	-		-
DAMSELFLIES (ZYGOPTERA)						
Ischnura	-	-	2	-		-
MIDGES (CHIRONOMIDAE)						
Polypedilum	-	4	3	-		9
Calopsectra	1	-	1	-		-
Spaniotoma	3	-	3	-		-
Pentaneura	1	3	1	-		5
Cryptochironomus	-	-	1	-		12
Chironomus	-	6	4	1		13
Cricotopus	3	2	1	-		-
Cardiocladius	-	-	1	-		-
BLOODWORMS (CHIRONOMIDAE)						
Chironomus	-	-	2	-		19
SLUDGEWORMS (TUBIFICIDAE)	1	-	7	-		34
Number of Kinds	14	5	15	11	0	9
Number of Organisms per Substrate	88	17	49	32	0	313

NO ORGANISMS

TABLE 24.

BOTTOM ORGANISMS, LITTLE THOMPSON RIVER, COLORADO, 1964

(Number Per Square Foot)

Station (River Miles) ——>	Collected in August		Collected in October	
	9.4	1.0	9.4	1.0
MAYFLIES (EPHEMEROPTERA)				
Trichorythodes	2	-	-	
BLACK FLIES				
Prosimulium	6	-	2	
Simulium	2	-	-	
SCUDS (AMPHIPODA)	6	-	5	
MIDGES (CHIRONOMIDAE)				
Spaniotoma	12	-	-	
Polypedilum	10	-	1	
Cryptochironomus	10	-	-	
Cricotopus	60	-	-	
SNAILS (GASTROPODA)	24			NO ORGANISMS
DAMSELFLIES (ZYGOPTERA)				
Ishnura	-	-	Q	
DRAGONFLIES (ANISOPTERA)				
Ophiogomphus	35	-	14	
FINGERNAIL CLAMS (SPHAERIDAE)	2	-	2	
SLUDGEWORMS (TUBIFICIDAE)	122	4	46	
Number of Kinds	12	1	7	0
Number per Square Foot	303	4	78	0

Q = Organisms not collected quantitatively; arbitrarily given value of one for computing.

TABLE 25.

BOTTOM ORGANISMS ON ARTIFICIAL SUBSTRATES,
LITTLE THOMPSON RIVER, COLORADO
1964

(Number per Substrate) (42 Days Exposure)

Station (River Miles) ——>	Recovered in September 9.4	Recovered in September 1.0	Recovered in October 9.4	Recovered in October 1.0
MAYFLIES (EPHEMEROPTERA)				
Caenis	-	-	1	
Baetis	-	-	1	
CADDISFLIES (TRICOPTERA)				
Agraylea	5	-	-	
BLACK FLIES (SIMULIDAE)				
Prosimulium	2	-	-	
Simulium	1	-	-	
DAMSEL FLIES (ZYGOPTERA)				
Ischnura	6	-	-	
DRAGONFLIES (CANISOPTERA)				
Ophiogomplus	1	-	7	
DANCE FLIES (EMPIDIDAE)	1	-	-	NO ORGANISMS
SCUDS (AMPHIPODA)	1	-	2	
SNAILS (GASTROPODA)	1	-	-	
MIDGES (CHIRONOMIDAE)				
Pentaneura	1	-	1	
Polypedilum	3	-	-	
Cardiocladius	1	-	-	
Spaniotoma	13	-	5	
Cricotopus	11	-	-	
Harnischia	1	-	-	
SLUDGEWORMS (TUBIFICIDAE)	26	6	11	
Number of Kinds	15	1	7	0
Number per Artificial Substrate	74	6	28	0

TABLE 26

CHEMICAL ANALYTICAL RESULTS, CACHE LA POUDRE RIVER, COLORADO

AUGUST 1966

(Milligrams per Liter, or Units)

Station (River Mile)	Date	pH, Units	Alkalinity	Hardness	Turbidity Units	Total Dissolved Solids	Total Suspended Solids	Acidity
51.7	8/13	7.2	115	125	2.2	187	4.4	10.5
	8/14	7.4	41	47	2.9	75	4.4	3.7
	8/15	7.8	55	64	2.7	92	4.8	7.2
	8/16	7.6	35	37	4.9	60	3.2	5.2
	8/17	7.1	33	34	7.4	56	5.2	2.7
Mean		-	56	62	-	94	5.2	5.9
46.8	8/13	7.7	83	122	1.4	157	0.8	2.5
	8/14	7.7	78	92	2.3	132	1.6	2.7
	8/15	7.7	37	37	2.9	55	12.8	2.7
	8/16	7.1	31	35	4.6	56	4.0	4.7
Mean		-	57	72	-	100	4.8	3.2
42.5	8/13	7.6	206	268	9.0	404	34.0	8.9
	8/14	7.8	216	262	16.0	377	38.0	7.7
	8/15	7.8	260	315	13.0	554	59.0	11.1
	8/16	7.7	69	90	11.6	123	36.0	6.4
	8/17	7.8	222	268	28.0	415	41.0	8.4
Mean		-	195	241	-	375	41.6	8.5
36.3	8/13	8.0	169	378	22.0	666	29.6	4.5
	8/14	7.9	162	355	8.3	603	9.6	2.2
	8/15	8.0	159	338	14.4	565	28.8	3.9
	8/16	7.5	114	275	35.0	486	58.8	8.2
	8/17	7.6	110	235	46.0	346	92.8	6.2
Mean		-	143	316	-	533	43.9	5.0
27.4	8/13	8.2	202	520	5.5	1032	17.6	2.0
	8/14	8.4	226	750	2.4	1420	4.4	0
	8/15	8.2	214	615	3.7	1206	5.6	2.9
	8/16	8.2	204	578	6.5	1176	8.0	0.7
	8/17	8.0	188	545	7.2	1100	7.6	4.5
Mean		-	207	602	-	1187	8.6	2.0
20.0	8/13	7.8	259	800	35.0	1569	76.8	10.4
	8/14	8.0	274	840	30.0	1628	51.2	8.4
	8/15	7.8	227	718	55.0	1337	83.2	10.2
	8/16	7.9	239	675	46.0	1268	58.4	11.4
	8/17	7.7	243	720	45.0	1360	78.0	8.2
Mean		-	248	751	-	1432	69.5	9.7
17.3	NOT SAMPLED							
10.3	8/13	7.9	322	1160	5.7	2288	8.0	10.9
	8/14	8.1	310	1120	3.4	2204	12.0	8.2
	8/15	8.0	300	1135	3.6	2182	21.2	12.1
	8/16	7.3	268	1165	4.6	2243	7.6	13.8
	8/17	8.0	312	1160	5.4	2236	5.2	13.4
Mean		-	302	1148	-	2231	10.8	11.7
2.5	8/13	7.6	334	820	14.0	1565	24.8	15.6
	8/14	8.1	359	815	15.0	1528	29.6	4.9
	8/15	7.8	357	825	9.8	1543	32.4	17.6
	8/16	8.0	359	815	6.5	1514	17.2	24.5
	8/17	7.7	341	842	11.0	1508	13.2	26.8
Mean	-	-	350	823	-	1532	23.4	17.9

TABLE 27.

CHEMICAL ANALYTICAL RESULTS, CACHE LA POUDRE RIVER, COLORADO

NOVEMBER, 1966

(Milligrams per Liter, or Units)

Station (River Mile)	Date	pH, Units	Alkalinity	Hardness	Turbidity, Units	Total Dissolved Solids	Total Suspended Solids	Volatile Suspended Solids
51.7	11/8	7.8	127	180	2.0	208	3	2
	11/9	7.6	168	220	1.5	295	4	2
	11/10	7.6	198	260	1.2	326	4	2
	11/11	7.8	126	166	2.9	254	13	7
Mean		-	155	207	-	271	6	4
46.8	11/8	7.8	146	190	2.7	277	10	3
	11/9	7.8	144	198	1.5	262	1	1
	11/10	7.6	148	190	2.3	256	2	2
	11/11	7.8	152	210	2.4	288	2	2
Mean		-	148	196	-	271	4	2
42.5	11/8	8.1	290	430	12.0	597	19	6
	11/9	7.9	286	420	8.0	590	14	5
	11/10	7.9	298	370	15.0	511	27	9
	11/11	8.1	300	384	8.0	546	20	7
Mean		-	294	401	-	561	20	7
36.3	11/7	8.3	260	1298	3.5	2362	4	2
	11/8	8.3	271	1310	5.5	2389	5	3
	11/9	8.1	246	1250	4.6	2205	6	2
	11/10	8.1	262	1190	5.7	2188	4	2
	11/11	8.0	274	1230	7.8	2334	5	3
Mean		-	263	1256	-	2296	5	2
27.4	11/7	8.2	226	852	1.5	1644	6	3
	11/8	8.3	249	840	12.0	1697	4	2
	11/9	8.0	262	850	-	1670	4	2
	11/10	8.0	256	896	2.5	1745	3	2
	11/11	8.1	266	960	3.2	1857	7	3
Mean		-	252	880	-	1722	5	2
20.0	11/7	7.3	380	964	34.0	1718	42	25
	11/8	7.3	398	990	28.0	1695	53	46
	11/9	7.2	384	1020	60.0	1785	88	48
	11/10	7.2	376	988	56.0	1738	89	45
	11/11	7.3	356	1008	63.0	1843	53	37
Mean		-	379	994	-	1756	65	40
17.3	11/8	7.5	380	1030	36.0	1786	36	22
	11/9	7.5	388	1000	53.0	1819	87	43
	11/10	7.3	376	1060	65.0	1817	59	24
	11/11	7.5	372	1010	70.0	1870	70	33
Mean		-	379	1025	-	1823	63	31
10.3	11/7	7.6	201	995	10.0	1797	10	6
	11/8	7.6	388	1010	5.5	1791	10	7
	11/9	7.4	378	986	23.0	1783	27	17
	11/10	7.2	378	1040	25.0	1846	28	19
	11/11	7.5	378	1020	34.0	1848	47	32
Mean		-	345	1010	-	1813	24	16
2.5	11/7	7.5	405	861	30.0	1586	76	23
	11/8	7.7	420	880	56.0	1540	80	28
	11/9	7.5	396	846	43.0	1565	50	17
	11/10	7.4	388	800	63.0	1527	72	27
	11/11	7.4	394	860	70.0	1595	71	32
Mean		-	401	849	-	1550	70	25

TABLE 28.

HEAVY METALS, CACHE LA POUDRE RIVER, COLORADO, AUGUST 1966

(Milligrams per Liter)

Station (River Miles)	Date	Iron	Aluminum	Manganese
51.7	8/13	< 0.1	< 0.5	< 0 1
	8/14	< 0.4	< 0 5	< 0.1
	8/15	0.2	< 0.5	< 0.1
	8/16	0.3	< 0.5	< 0.1
	Mean	< 0.3	< 0.5	< 0.1
46.8	8/13	< 0.1	< 0.5	< 0 1
	8/14	0.2	< 0.5	< 0.1
	8/15	0.3	< 0.5	< 0.1
	8/16	0.4	< 0.5	< 0.1
	Mean	< 0.3	< 0.5	< 0.1
42 5	8/13	0.8	< 0.5	< 0.1
	8/14	1.0	1.0	0.1
	8/15	1.5	1.0	< 0.1
	8/16	1.4	< 0.5	< 0.1
	Mean	1.2	< .3	< 0.1
36.3	8/13	1.0	0.5	< 0.1
	8/14	0.5	< 0.5	0.1
	8/15	1.0	0.5	< 0.1
	8/16	2.4	1.7	0.1
	Mean	1.3	< 0.8	< 0.1
27.4	8/13	0.4	< 0.5	0.2
	8/14	0.2	< 0.5	0.3
	8/15	0.4	< 0.5	0.1
	8/16	0.2	< 0.5	< 0.1
	Mean	0.3	< 0.5	< 0.2
20.0	8/13	1.8	1.8	0.2
	8/14	1.8	1.8	0.2
	8/15	2.0	1.9	0.2
	8/16	1.4	1.5	0.2
	Mean	1.8	1.8	0.2
17.3	NOT SAMPLED			
10.3	8/13	0.5	< 0.5	0.3
	8/14	0.4	< 0.5	0.2
	8/15	0.6	< 0.5	0.2
	8/16	0.4	< 0.5	0.1
	Mean	0.5	< 0.5	0.2
2.5	8/13	0.8	0.5	0.5
	8/14	0.6	< 0.5	0.6
	8/15	0.6	< 0.5	0.5
	8/16	0.4	< 0.5	0.7
	Mean	0.6	< 0.5	0.6

ZINC - All analyses less than 0.02 mg/1.
COPPER - All analyses 0.02 mg/1 or less.
SILVER - All analyses less than 0.04 mg/1.
CHROMIUM - All analyses less than 0.05 mg/1.
LEAD - All analyses 0.01 mg/1 or less.

TABLE 29.

HEAVY METALS, CACHE LA POUDRE RIVER, COLORADO, NOVEMBER 1966

(Milligrams per Liter)

Station (River Miles)	Date	Iron	Aluminum	Manganese
51.7	11/7	-	-	-
	8	0.2	-	< 0.1
	9	< 0.2	< 0.5	0.1
	10	< 0.2	< 0.5	< 0.1
	11	0.6	< 0.5	0.1
	Mean	< 0.3	< 0.5	< 0.1
46.8	11/7	-	-	-
	8	1.0	0.5	0.2
	9	0.4	< 0.5	0.1
	10	0.4	< 0.5	0.1
	11	-	-	-
	Mean	0.6	< 0.5	0.1
42.5	11/7	-	-	-
	8	0.4	2.0	0.1
	9	0.6	< 0.5	0.1
	10	< 0.2	< 0.5	< 0.1
	11	0.6	< 0.5	0.1
	Mean	< 0.5	< 0.9	< 0.1
36.3	11/7	0.2	< 0.5	0.1
	8	0.4	9.3	0.1
	9	0.8	0.5	0.2
	10	0.4	0.5	0.1
	11	0.6	< 0.5	0.2
	Mean	0.5	< 2.5	0.1
27.4	11/7	0.2	0.5	0.1
	8	< 0.2	0.5	0.1
	9	0.2	0.5	0.1
	10	0.2	0.5	0.1
	11	0.2	0.5	0.1
	Mean	< 0.2	0.5	0.1
20.0	11/7	0.9	1.0	0.3
	8	0.9	1.0	0.3
	9	1.3	1.0	0.3
	10	1.2	2.0	0.2
	11	2.0	2.0	0.2
	Mean	1.3	1.4	0.3
17.3	11/7	-	-	-
	8	0.6	21.5	0.2
	9	1.4	2.0	0.2
	10	0.4	0.5	< 0.1
	11	1.2	0.5	0.2
	Mean	0.9	6.1	< 0.2
10.3	11/7	0.4	< 0.5	0.3
	8	0.3	0.5	0.2
	9	0.6	0.5	0.3
	10	0.9	0.5	0.3
	11	0.6	< 0.5	0.2
	Mean	0.6	< 0.5	0.3
2.5	11/7	1.7	2.0	0.5
	8	1.4	1.8	0.5
	9	1.7	2.0	0.5
	10	1.7	2.0	0.4
	11	1.8	1.0	0.4
	Mean	1.7	1.8	0.5

ZINC - All analyses 0.02 mg/l or less
COPPER - All analyses 0.02 mg/l or less
SILVER - All analyses less than 0.04 mg/l
CHROMIUM - All analyses less than 0.02 mg/l
LEAD - All analyses 0.01 mg/l or less

TABLE 30. NITROGEN AND PHOSPHORUS DATA, CACHE LA POUDRE RIVER, AUGUST, 1966

Micrograms per liter

Station (River Mile)	Date	Ammonia Nitrogen	Nitrate Nitrogen	Total Inorganic Nitrogen	Organic Nitrogen	Total Nitrogen	Total Phosphorus	Soluble Phosphorus
51.7	8/13	60	500	-	400	-	30	< 5
	8/14	20	100	-	400	-	20	< 5
	8/15	10	200	-	300	-	17	< 5
	8/16	< 10	< 100	-	500	-	16	< 5
	8/17	-	-	-	-	-	-	< 5
	Mean	< 25	<225	< 250	450	< 700	22	< 5
46.8	8/13	20	200	-	400	-	18	5
	8/14	20	100	-	200	-	10	10
	8/15	< 10	< 100	-	900	-	15	-
	8/16	< 10	< 100	-	400	-	15	< 5
	Mean	< 15	< 125	< 140	475	< 615	15	< 7
42.5	8/13	1160	1800	-	1400	-	900	640
	8/14	700	400	-	1400	-	415	285
	8/15	1040	2700	-	1300	-	350	250
	8/16	440	300	-	700	-	360	220
	8/17	-	-	-	-	-	-	310
	Mean	830	1300	2130	1200	3330	558	341
36.3	8/13	400	1800	-	800	-	690	460
	8/14	180	1600	-	600	-	550	500
	8/15	480	1700	-	800	-	480	350
	8/16	170	1100	-	1200	-	525	365
	8/17	-	-	-	-	-	-	280
	Mean	308	1550	1858	850	2708	562	391
27.4	8/13	270	1300	-	700	-	225	90
	8/14	160	1300	-	600	-	100	10
	8/15	130	900	-	800	-	205	9
	8/16	180	700	-	100	-	135	100
	8/17	-	-	-	-	-	-	120
	Mean	185	1050	1235	550	1785	166	66
20.0	8/13	300	2400	-	1400	-	220	90
	8/14	150	2700	-	1000	-	230	10
	8/15	210	[illegible]	-	1400	-	215	5
	8/16	120	[illegible]	-	1000	-	200	145
	8/17	-	-	-	-	-	-	150
	Mean	195	2425	2620	1200	3820	217	80
17.3	NOT SAMPLED							
10.3	8/13	340	3500	-	1000	-	67	5
	8/14	220	3000	-	900	-	35	7
	8/15	150	3000	-	1000	-	48	7
	8/16	60	3500	-	1000	-	50	7
	8/17	-	-	-	-	-	-	< 5
	Mean	193	3250	3443	925	4368	50	< 6
2.5	8/13	1320	2300	-	1700	-	300	45
	8/14	1700	2000	-	1300	-	285	10
	8/15	1440	2600	-	1200	-	185	14
	8/16	1340	2000	-	1200	-	195	130
	8/17	-	-	-	-	-	-	105
	Mean	1450	2225	3675	1350	5025	242	61

TABLE 31. NITROGEN AND PHOSPHORUS DATA, CACHE LA POUDRE RIVER, NOVEMBER, 1966

Micrograms per Liter

Station (River Miles)	Date	Ammonia Nitrogen	Nitrate Nitrogen	Total Inorganic Nitrogen	Organic Nitrogen	Total Nitrogen	Total Phosphorus	Soluble Phosphorus
51.7	11/7	-	-	-	-	-	-	-
	11/8	80	300	-	500	-	50	5
	11/9	260	500	-	700	-	65	< 5
	11/10	450	700	-	300	-	30	< 5
	11/11	140	400	-	900	-	100	7
	Mean	233	475	708	600	1308	71	< 5
46.9	11/7	-	-	-	-	-	-	-
	11/8	120	300	-	400	-	40	< 5
	11/9	60	200	-	500	-	< 5	< 5
	11/10	40	200	-	300	-	< 5	< 5
	11/11	-	-	-	-	-	17	< 5
	Mean	73	233	306	400	706	< 9	< 5
42.5	11/7	-	-	-	-	-	-	-
	11/8	20	3000	-	800	-	105	60
	11/9	480	2800	-	1000	-	200	90
	11/10	320	500	-	1200	-	150	40
	11/11	260	3300	-	900	-	175	10
	Mean	270	2400	2670	975	3645	181	21
36.3	11/7	80	600	-	700	-	150	10
	11/8	75	2600	-	800	-	140	55
	11/9	480	3300	-	1200	-	260	45
	11/10	400	3700	-	800	-	175	5
	11/11	320	3500	-	800	-	175	10
	Mean	271	2740	3011	860	3871	184	23
27.4	11/7	50	900	-	800	-	60	< 5
	11/8	80	800	-	1000	-	50	12
	11/9	60	1800	-	700	-	60	-
	11/10	100	2700	-	800	-	30	< 5
	11/11	80	2000	-	800	-	25	15
	Mean	80	1640	1720	820	2540	45	< 9
20.0	11/7	640	100	-	3900	-	800	525
	11/8	1620	< 100	-	5500	-	1235	590
	11/9	420	600	-	5500	-	1160	555
	11/10	1040	600	-	17000	-	910	475
	11/11	1080	600	-	3900	-	950	400
	Mean	960	< 400	< 1360	7160	< 8520	1015	509
17.3	11/7	-	-	-	-	-	-	-
	11/8	60	< 100	-	3480	-	885	395
	11/9	1600	500	-	5200	-	-	495
	11/10	1620	< 100	-	4100	-	625	500
	11/11	600	800	-	3700	-	925	330
	Mean	970	< 375	< 1345	4100	5445	813	430
10.3	11/7	520	< 100	-	3000	-	630	405
	11/8	515	< 100	-	2600	-	680	390
	11/9	940	700	-	3600	-	580	120
	11/10	460	300	-	3000	-	485	60
	11/11	640	300	-	3300	-	490	230
	Mean	615	< 300	< 915	3100	4015	541	241
2.5	11/7	1480	400	-	7300	-	870	390
	11/8	1860	100	-	3700	-	1180	570
	11/9	-	500	-	4100	-	810	205
	11/10	1820	400	-	3600	-	705	440
	11/11	1720	400	-	3500	-	780	485
	Mean	1720	360	2080	4580	6600	869	406

TABLE 32. SUMMARY OF ANALYSES OF PERIPHYTON FROM GLASS-SLIDE SUBSTRATES, CACHE LA POUDRE RIVER, 1966

(10 Days Exposure)

Station (River Mile)	Chlorophyll A mg/sq inch	Carbon mg/sq inch	Ratio, Carbon to Chlorophyll x 10^3	Number Algal cells/sq inch	Predominant Organisms
Recovered in August					
51.7	0.83	5.9	7.1	1,260,000	Nitzchia
42.5	36.2	8.5	0.2	11,600,000	Navicula, Nitzchia, Achnanthes
36.3	25.5	7.0	0.3	14,700,000	Navicula, Nitzchia, Achnanthes
27.4	4.8	6.8	1.4	1,210,000	Achnanthes, Nitzchia
20.0	6.4	10.1	1.7	1,030,000	Navicula, Nitzchia, Achnanthes
17.3	NOT SAMPLED				
10.5	27.8	12.1	0.43	2,635,000	Scenedesmus, Achnanthes
2.5	10.1	35.7	2.9	620,000	Achnanthes, Scenedesmus
Recovered in November					
51.7	10.4	36	2.2	1,339,000	Diatoma, Nitzchia
42.5	16.0	50	3.1	1,884,000	Diatoma
36.3	39.7	70	1.8	7,630,000	Pennate Diatoms, Euglena, Phormidium
27.4	1.4	17	12.1	169,000	Nitzchia, Diatoma
20.0	12.5	119	9.5	925,000	Pennate Diatoms, Euglena (Heavy Silt)
17.3	0	24	24+	42,000	Bacteria, Sphaerotilus, Pennate Diatoms
10.5	0	19	19+	18,000	Bacteria, Sphaerotilus, Euglena
2.5	0	23	23+	4,800	Bacteria, Pennate Diatoms

TABLE 33.

BOTTOM ORGANISMS, CACHE LA POUDRE RIVER, COLORADO, 1964

(Number per Square Foot)

Station (River Miles) ——→	Collected in August						Collected in October					
	51.7	41.2	31.7	20.3	10.6	2.9	51.7	41.2	31.7	20.3	10.6	2.9
STONEFLIES (PLECOPTERA)												
Acroneuria	[illegible]	-	-	-	-	-	5	-	-	-	-	
Pteronarcella	-	-	-	-	-	-	7	-	-	-	-	
Brachyptera	-	-	-	-	-	-	5	-	-	-	-	
MAYFLIES (EPHEMEROPTERA)												
Ameletus	40	110	4	-	-	-	-	1	-	-	-	
Ephemerella	72	10	-	-	-	-	26	23	-	-	-	
Baetis	80	110	6	-	-	-	5	-	8	-	-	
Siphlonurus	-	-	-	-	-	-	-	1	-	-	-	
Heptagenia	[illegible]	-	4	-	-	-	14	-	-	-	-	
Rithrogenia	8	-	-	-	-	-	26	-	-	-	-	
Cinygma	12	-	4	-	-	-	-	-	-	-	-	
Trichorythodes	-	370	104	-	-	-	-	12	28			
CADDISFLIES (TRICOPTERA)												
Glossosoma	[illegible]	-	-	-	-	-	10	-	-	-	-	
Brachycentrus	[illegible]	-	-	-	-	-	44	-	-	-	-	
Hydropsyche	-	-	-	-	-	-	40	-	-	-	-	
Ceratopsyche	[illegible]	-	24	-	-	-	54	1	142	-	-	
Arctopsyche	[illegible]	-	-	-	-	-	52	-	-	-	-	
Agraylea	-	-	60	-	340	-	-	-	-	-	-	
RIFFLE BEETLES (ELMIDAE)	-	-	-	-	-	-	1	-	-	-	-	
BLACK FLIES (SIMULIDAE)												
Prosimulium	40	22	32	-	24	-	-	-	11	-	20	
Simulium	[illegible]	8	16	-	8	4	-	-	7	-	10	
Cnephia	6	-	-	-	-	-	-	-	-	-	-	
MIDGES (CHIRONOMIDAE)												
Spaniotoma	28	1000	24	-	-	-	56	11	30	-	-	
Polypedilum	82	200	-	-	-	-	-	20	-	-	-	
Cardiocladius	18	-	-	-	-	-	-	-	23	-	-	
Tendipes	-	92	-	-	1500	-	-	-	15	-	-	
Cricotopus	+	900	480	-	-	-	-	-	-	-	-	
Criptochironomus	-	-	-	1	-	-	-	-	-	-	-	
Pentaneura	-	-	-	-	22	-	-	-	-	-	-	
SNAILS (GASTROPODA)	-	-	154	-	144	76	-	-	104	-	-	
LIMPETS (FERRESIA)	-	-	10	-	-	-	-	-	-	-	-	
SOWBUGS (ASELLUS)	-	-	-	-	-	-	-	2	-	-	-	
SCUDS (AMPHIPODA)	-	-	6	-	696	4	-	-	2	-	210	
DAMSELFLIES (ZYGOPTERA)												
Ischnura	-	-	-	-	Q	-	-	-	-	-	-	
LEECHES (HIRUDINEA)	-	12	1	-	Q	-	-	1	2	-	-	
BLOODWORMS (CHIRONOMIDAE)												
Chironomus	-	-	-	30	-	24	-	-	-	3	-	
EARTHWORMS (TUBIFICIDAE)	4	200	152	31	264	288	-	99	7	41	2020	
Number of Kinds	18	12	16	3	10	5	14	10	12	2	4	
Number of Organisms per Square Foot	1153	3634	1171	62	3000	396	445	171	379	44	2260	

NO ORGANISMS

Q = Organisms not collected quantitatively; arbitrarily given value of one for computing.

TABLE 24.

SUMMARY OF FISH CAPTURED IN TEST NETS,

CACHE LA POUDRE RIVER, COLORADO, AUGUST, 1966

(Total for 4 Net Days or Equivalent) (Weight in Grams)

Species	Station (River Mile) 51.7 Number	51.7 Weight	42.5 Number	42.5 Weight	36.3 Number	36.3 Weight	27.4 Number	27.4 Weight	20.0 Number	20.0 Weight	17.3 Number	17.3 Weight	10.3 Number	10.3 Weight	2.5 Number	2.5 Weight
GAME FISH																
Rainbow Trout	4	316														
Pumpkinseed													1	5		
Black Bullhead			2	72	18	2231			2	280			7	27	6	391
Sub-total	4	316	2	72	18	2231			2	280			8	32	6	391
FORAGE FISH																
Green Sunfish									1	28			24	47	11	191
Longnose Dace	40	144	4	26												
Bigmouth Shiner			124	188									33	62	1	1
River Shiner			2	6					2	7						
Plains Shiner									43	93						
Red Shiner			1	2												
Common Shiner					19	352			2	37			20	46		
Rio Grande Chub			40	532					17	715			126	946	29	295
Brassy Minnow									8	12						
Fathead Minnow					1	2			1	3			7	27		
Mountain Sucker					6	84			7	40			42	120		
White Sucker			118	7620	56	4541			2	544			33	6289	8	2433
Longnose Sucker	200	7392														
Sub-total	240	7536	289	8374	82	4979			83	1479			285	7537	49	2920
ROUGH FISH																
Carp			8	2612	11	112			4	276			35	222		
Sub-total	0	0	8	2612	11	112			4	276			35	222	0	0
GRAND TOTAL	244	7852	299	11058	111	7322			89	2035			328	7791	55	3311

NOT SAMPLED

NOT SAMPLED

TABLE 35.

SUMMARY OF FISH CAPTURED IN TEST-NETS,

CACHE LA POUDRE RIVER, COLORADO, NOVEMBER, 1966

(Total for 4 Net-Days or Equivalent) (Weight in Grams)

Species	Station 51.? Number	51.? Weight	42.5 Number	42.5 Weight	36.3 Number	36.3 Weight	27.5 Number	27.5 Weight	20.0 Number	20.0 Weight	17.3 Number	17.3 Weight	10.3 Number	10.3 Weight	2.5 Number	2.5 Weight
GAME FISH																
Rainbow Trout	8	419														
Black Crappie							2	92								
Sub-total	8	419	0	0			2	92	0	0	0	0	0	0	0	0
FORAGE FISH																
Longnose Dace							2	2								
Bigmouth Shiner							16	30								
Common Shiner					NOT SAMPLED		162	1862			1	30				
Rio Grande Chub							30	146	NO FISH				NO FISH			
Fathead Minnow							2	4								
White Sucker	22	4762	126	15063			240	16534			1	152			5	748
Longnose Sucker	81	4280	69	4893			10	778								
Sub-total	103	9042	195	19956			462	20678	0	0	2	182	0	0	5	748
ROUGH FISH																
Carp							68	1560								
Sub-total	0	0	0	0			68	1560	0	0	0	0	0	0	0	0
GRAND TOTAL	111	9461	195	19956			532	22330	0	0	2	182	0	0	5	748

TABLE 36. CHEMICAL ANALYTICAL RESULTS, GENEVA CREEK, COLORADO, JULY, 1966

Station (River Miles) Flow in cfs	Date	pH	Alkalinity mg/l	Alkalinity lbs/day	Hardness mg/l	Hardness lbs/day	Turbidity Units	Total Dissolved Solids mg/l	Total Dissolved Solids lbs/day	Total Suspended Solids mg/l	Total Suspended Solids lbs/day	Acidity mg/l	Acidity lbs/day
13.5	7/23	4.0	-	-	29	-	0.3	99	-	-	-	28	-
cfs 1.2	7/26	3.9	-	-	38	-	0.1	125	-	-	-	29	-
	Mean	-	-	-	34	220	-	112	726	-	-	29	187
12.5	7/22	3.4	-	-	38	-	13.7	127	-	2.8	-	94	-
cfs 1.9	7/23	3.4	-	-	42	-	16.2	227	-	4.4	-	95	-
	7/24	3.3	-	-	37	-	12.3	177	-	3.6	-	97	-
	7/26	3.4	-	-	42	-	0.5	233	-	1.6	-	102	
	Mean	-	-	-	40	410	-	191	1959	3.1	32	97	995
9.2	7/22	-	-	-	-	-	-	-	-	-	-	-	-
cfs 7.6	7/23	4.4	-	-	36	-	4.2	101	-	8.4	-	26	-
	7/24	4.4	-	-	36	-	2.6	111	-	3.6	-	26	-
	7/26	4.5	-	-	38	-	2.1	116	-	4.4	-	27	-
	Mean	-	-	-	37	1518	-	109	4473	5.5	226	26	1067
6.8	7/22	4.5	-	-	36	-	2.0	43	-	3.6	-	26.2	-
cfs 13.2	7/23	5.4	2.0	-	31	-	2.1	65	-	8.8	-	7.8	-
	7/24	5.6	1.0	-	30	-	3.9	85	-	9.2	-	7.1	-
	7/26	5.2	2.5	-	31	-	3.8	77	-	6.0	-	9.3	-
	Mean	-	1.4	100	32	2280	-	68	4847	6.9	492	12.6	898
4.0	7/22	7.5	11	-	21	-	1.1	40	-	4.8	-	2.2	-
cfs 44.6	7/23	7.0	11	-	21	-	1.8	61	-	3.6	-	3.7	-
	7/24	7.3	11	-	24	-	2.7	44	-	5.6	-	2.7	-
	7/26	7.3	12	-	24	-	3.2	40	-	6.0	-	2.9	-
	Mean	-	11	2649	23	5539	-	46	11079	5.0	1204	2.9	698
2.5	7/22	7.4	10	-	22	-	1.6	43	-	4.0	-	2.2	-
cfs 51.7	7/23	7.2	11	-	22	-	3.0	61	-	-	-	4.2	-
	7/24	7.3	11	-	23	-	2.1	40	-	5.6	-	3.4	-
	7/26	7.3	12	-	24	-	2.6	32	-	8.4	-	2.0	-
	Mean	-	11	3070	23	6421	-	44	12283	6.1	1703	3.0	838

TABLE 27. CHEMICAL ANALYTICAL RESULTS, TRIBUTARIES OF GENEVA CREEK, COLORADO, JULY 1966

Stream and Flow in cfs	Date	pH	Alkalinity mg/l	Alkalinity lbs/day	Hardness mg/l	Hardness lbs/day	Turbidity Units	Total Dissolved Solids mg/l	Total Dissolved Solids lbs/day	Total Suspended Solids mg/l	Total Suspended Solids lbs/day	Acidity mg/l	Acidity lbs/day
Smelter Gulch cfs 4.3	7/22	7.1	14	-	25	-	1.0	48	-	1.6	-	3.2	-
	7/23	7.4	30	-	37	-	.5	52	-	-	-	2.9	-
	7/24	7.5	31	-	38	-	.9	13	-	0.4	-	2.7	-
	7/26	7.5	35	-	37	-	.1	34	-	0.8	-	2.9	-
	Mean	-	28	650	34	789	-	37	859	0.9	21	2.9	67
Duck Creek cfs 3.1	7/23	7.2	20	-	20	-	1.6	58	-	1.2	-	3.2	-
	7/24	7.5	21	-	22	-	1.7	49	-	2.0	-	3.2	-
	7/26	7.4	21	-	25	-	1.4	43	-	1.6	-	3.4	-
	Mean	-	21	351	22	368	-	50	837	1.6	27	3.3	55
Bruno Gulch cfs 2.3	7/22	7.4	32	-	38	-	0.3	61	-	-	-	3.4	-
	7/23	6.8	13	-	24	-	1.8	63	-	2.0	-	3.2	-
	7/24	7.5	16	-	24	-	1.7	50	-	5.2	-	2.4	-
	7/26	6.6	17	-	24	-	1.4	53	-	2.0	-	4.9	-
	Mean	-	20	248	28	348	-	57	708	3.1	39	3.5	43
Scott Gomer Creek cfs 31.0	7/22	7.7	14	-	14	-	1.1	27	-	0.4	-	2.4	-
	7/23	7.0	15	-	18	-	1.3	41	-	0.8	-	3.2	-
	7/24	6.7	14	-	15	-	2.3	46	-	11.2	-	3.4	-
	7/26	7.3	17	-	36	-	2.0	35	-	1.6	-	2.9	-
	Mean	-	15	2511	21	3515	-	37	6194	3.5	586	3.0	502

TABLE 8. IRON AND MANGANESE DATA, GENEVA CREEK AND TRIBUTARIES, COLORADO, JULY 1966

Geneva Creek						Tributaries					
Station (River Miles) Flow in cfs	Date	Iron mg/l	Iron lbs/day	Manganese mg/l	Manganese lbs/day	Stream	Date	Iron mg/l	Iron lbs/day	Manganese mg/l	Manganese lbs/day
RM 13.5	7/22					Smelter Gulch	7/22	< 0.1		< 0.1	
cfs = 1.2	7/23	0.4		1.4		cfs = 4.3	7/23	0.2		< 0.1	
	7/24						7/24	0.2		< 0.1	
	7/26	0.4		1.4			7/26	0.2		< 0.1	
Mean		0.4	2.6	1.4	9.1	Mean		< 0.18	< 4.2	< 0.1	< 2.3
RM 12.5	7/22	7.4		1.6		Duck Creek	7/23	0.4		< 0.1	
cfs = 1.9	7/23	7.5		1.7		cfs = 3.1	7/24	0.4		< 0.1	
	7/24	7.9		1.7			7/26	0.4		< 0.1	
	7/26	8.2		1.7		Mean		0.4	6.7	< 0.1	< 1.7
Mean		7.75	79.5	1.68	17.3						
RM 9.2	7/22	2.0		0.6		Bruno Gulch	7/22	0.4		< 0.1	
cfs = 7.6	7/23	2.5		0.6		cfs = 2.3	7/23	0.6		< 0.1	
	7/24	1.8		0.6			7/24	0.4		< 0.1	
	7/26	2.0		0.6		Mean		0.47	5.8	< 0.1	1.2
Mean		2.08	85.3	0.6	24.6						
RM 6.8	7/22					Scott Gomer Creek	7/22	0.6		< 0.1	
cfs = 13.2	7/23	1.1		0.4		cfs = 31.0	7/23	1.0		< 0.1	
	7/24	1.1		0.4			7/24	1.2		< 0.1	
	7/26	1.2		0.4			7/26	0.4		< 0.1	
Mean		1.13	80.5	0.4	28.5	Mean		0.8	134.9	< 0.1	16.7
RM 4.0	7/22	1.2		0.2							
cfs = 44.6	7/23	0.9		0.1							
	7/24	0.6		0.1							
	7/26	1.0		0.1							
Mean		0.93	224.0	0.13	31.3						
RM 2.5	7/22	0.6		0.1							
cfs = 51.7	7/23	0.8		0.2							
	7/24	0.6		0.1							
	7/26	0.6		< 0.1							
Mean		0.65	181.4	< 0.13	< 36.3						

TABLE 9. NITROGEN AND PHOSPHORUS DATA, GENEVA CREEK, COLORADO, JULY 1966

Station (River Miles) Flow in cfs	Date	Ammonia µg/l	Ammonia lbs/day	Nitrate µg/l	Nitrate lbs/day	Total Inorganic Nitrogen µg/l	Total Inorganic Nitrogen lbs/day	Organic Nitrogen µg/l	Organic Nitrogen lbs/day	Total Nitrogen µg/l	Total Nitrogen lbs/day	Total Phosphorus µg/l	Total Phosphorus lbs/day
RM 13.5	7/23	40		100				850				< 5	
cfs = 1.2	7/26	10		< 100				100				< 5	
Mean		25	0.16	< 100	< 0.65	< 125	< 0.81	475	3.08	< 600	< 3.89	< 5	< 0.03
RM 12.5	7/22	30		< 100				400				25	
cfs = 1.9	7/23	50		< 100				200				25	
	7/24	40		200				100				25	
	7/26	30		200				650				20	
Mean		38	0.40	< 150	< 1.54	< 188	< 1.94	338	3.46	< 526	< 5.40	24	0.25
RM 9.2	7/22	10		< 100				500				20	
cfs = 7.6	7/23	30		< 100				700				15	
	7/24	50		100				450				5	
	7/26	30		100				400				< 5	
Mean		30	1.23	< 100	< 4.10	< 130	< 5.33	513	21.03	< 643	< 26.36	11	0.45
RM 6.8	7/23	20		< 100				450				10	
cfs = 13.2	7/24	< 10		< 100				150				5	
	7/26	20		< 100				100				< 5	
Mean		< 17	< 1.21	< 100	< 7.13	< 117	< 8.34	233	16.60	< 350	< 24.94	< 7	< 0.50
RM 4.0	7/22	20		< 100				1,000				10	
cfs = 44.6	7/23	< 10		200				500				10	
	7/24	30		100				300				10	
	7/26	10		100				300				5	
Mean		< 18	< 4.34	< 125	< 30.11	< 143	< 34.45	525	126.44	< 668	< 160.89	9	2.17
RM 2.5	7/22	50		< 100				500				5	
cfs = 51.7	7/23	40		< 100				600				20	
	7/24	20		100				150				10	
	7/26	10		< 100				250				5	
Mean		30	8.38	< 100	< 27.92	< 130	< 36.30	375	104.69	< 505	< 140.99	10	2.79

TABLE 40. NITROGEN AND PHOSPHORUS DATA, TRIBUTARIES OF GENEVA CREEK, COLORADO, JULY 1966

Stream Flow in cfs	Date	Ammonia µg/l	Ammonia lbs/day	Nitrate µg/l	Nitrate lbs/day	Total Inorganic Nitrogen µg/l	Total Inorganic Nitrogen lbs/day	Organic Nitrogen µg/l	Organic Nitrogen lbs/day	Total Nitrogen µg/l	Total Nitrogen lbs/day	Total Phosphorus µg/l	Total Phosphorus lbs/day
Smelter Gulch cfs = 4.3	7/22	10		< 100				100				15	
	7/23	20		100				900				10	
	7/24	20		< 100				200				< 5	
	7/26	10		< 100				< 50				< 5	
Mean		15	0.35	< 100	< 2.32	< 115	< 2.67	< 313	< 7.27	< 438	< 9.94	< 9	0.21
Duck Creek cfs = 3.1	7/23	40		< 100				600				20	
	7/24	10		< 100				350				5	
	7/26	30		< 100				1,000				< 5	
Mean		27	0.45	< 100	< 1.67	< 127	< 2.12	650	10.88	< 777	< 13.00	< 10	< 0.16
Bruno Gulch cfs = 2.3	7/22	10		< 100				400				10	
	7/23	10		< 100				900				5	
	7/24	< 10		< 100				450				5	
	7/26	20		< 100				600				< 5	
Mean		< 13	< 0.16	< 100	< 1.24	< 113	< 1.40	588	7.30	< 701	< 8.70	< 6	< 0.07
Scott Gomer Creek cfs = 31.0	7/22	10		< 100				300				< 5	
	7/23	< 10		100				750				20	
	7/24	30		100				300				< 5	
	7/26	20		< 100				200				< 5	
Mean		18	< 3.01	< 100	< 16.74	< 118	< 19.75	388	64.95	< 506	84.70	< 9	< 1.51

Table 41. SUMMARY OF ANALYSES OF PERIPHYTON FROM GLASS-SLIDE SUBSTRATES, GENEVA CREEK AND TRIBUTARIES, JULY-AUGUST, 1966

(10 Days Exposure)

Station (River Miles)	Chlorophyll Micrograms/Sq. Inch	Diatoms Number/Sq. Inch	All Algae Number/Sq. Inch	Predominant Kind(s)
12.5	< 0.24	8,800	8,800	Pinnularia, Eunotia
9.2	< 0.32	0	< 100	None Predominant
4.0	2.50	31,100	33,300	None Predominant
2.5	2.58	44,400	55,500	None Predominant
SHELTER GULCH	6.83	800,300	1,633,300	Synedra, Ulothrix
BRUNO GULCH	0.38	91,100	91,100	Achnanthes
SCOTT GOMER CREEK	< 0.38	8,800	8,800	Synedra

TABLE 42. BOTTOM ANIMALS, GENEVA CREEK AND TRIBUTARIES, COLORADO

JULY 1966

(Number Per Square Foot)

	Station (River Mile)									
	13.5	12.5	9.2	6.8	4.0	2.5	Melter Gulch	Duck Creek	Bruno Gulch	Scott Gomer Creek
STONEFLIES (PLECOPTERA)										
Isogenus	-	-		-	-	-	5	2	-	-
Acroneuria	-	-		-	-	-	-	4	-	-
Nemoura	-	-		-	1	7	-	-	1	2
Isoperla	-	-		-	2	-	-	-	-	2
Brachyptera	-	-		-	2	-	-	-	-	-
Perlesta	-	-		Q	-	-	-	-	-	-
MAYFLIES (EPHEMEROPTERA)										
Ephemerella	-	-		-	-	-	5	1	1	2
Ironopsis	-	-		-	2	2	21	4	6	10
Cinygmula	-	-		-	-	1	24	-	-	12
Ameletus	-	-		-	-	-	2	-	-	-
Pseudocloeon	-	-		-	-	-	-	33	3	-
Iron	-	-		-	-	-	-	-	1	-
Baetis	-	-		-	1	14	-	-	10	34
Rhithrogenia	-	-		-	-	5	-	-	-	-
CADDISFLIES (TRICOPTERA)										
Psychomia	-	-		-	-	1	5	Q	1	1
Leptocerus	Q	-		-	-	-	-	-	-	-
Glossoma	-	-		-	-	-	1	-	-	-
Arctopsyche	-	-		-	Q	3	-	Q	-	-
Rhyacophia	-	-		-	-	-	-	-	-	Q
RIFFLE BEETLES (ELMIDAE)										
Optioservus	-	-		-	-	1	-	1	11	-
Agabus	-	-		-	-	-	-	-	-	Q
MOUNTAIN MIDGES (DEUTEROPHLEBIIDAE)										
Deuterophlebia	-	-		-	1	-	-	-	-	-
BLACK FLIES (SIMULIDAE)										
Prosimulium	-	-		-	1	-	1	-	10	-
Simulium	-	-		-	Q	-	-	2	31	13
HORSE FLIES (TABANIDAE)	-	-		-	-	-	-	-	-	Q
DANCE FLIES (EMPIDIDAE)	Q	-		-	-	-	-	-	-	-
MIDGES (CHIRONOMIDAE)										
Prodiasema	4	-		-	-	1	-	Q	-	-
Cardiocladius	12	-		-	-	-	10	2	-	-
Pseudochironimus	-	-		-	-	-	3	-	-	-
Cricotopus	-	-		-	-	-	-	9	-	5
Brillia	4	-		-	Q	-	-	3	3	-
SLUDGE WORMS (TUBIFICIDAE)	-	-		-	-	-	16	16	-	Q
Number of Kinds	5	1		1	10	9	12	16	11	13
Number per square foot	22	1		1	12	35	94	82	78	85

NO ORGANISMS

Q = Organisms not collected quantitatively; arbitrarily given value of one for computing.

TABLE 4?.

SUMMARY OF FISH CAPTURED IN TEST-NETS. GENEVA CREEK AND BRUNO GULCH, JULY 1966

(Total for 4 Net Days or Equivalent) (Weights in Grams)

	Station (River Mile)									
	12.5		9.2		4.0		2.5		Bruno Gulch	
	number	weight	number	weight	number	weight	number	weight	number	weight
Brook Trout	0	0	0	0	2	106	0	0	9	180
Rainbow Trout	0	0	0	0	0	0	2	304	0	0
Brown Trout	0	0	0	0	3	242	3	522	0	0
Total	none		none		5	348	5	826	9	186

Table 44. CHEMICAL ANALYTICAL RESULTS, CLEAR CREEK, COLORADO, AUGUST 1966

Station (River Miles) Flow in cfs	Date	pH Units	Alkalinity mg/l	Alkalinity lbs/day	Hardness mg/l	Hardness lbs/day	Turbidity Units	Total Dissolved Solids mg/l	Total Dissolved Solids lbs/day	Total Suspended Solids mg/l	Total Suspended Solids lbs/day	Acidity mg/l	Acidity lbs/day
54.9	8/6	7.4	33		33		2.5	46		4.4		2.4	
	8/7	7.9	32		38		1.7	54		3.6		1.5	
cfs = 16.7	8/8	7.7	33		39		2.5	60		4.4		2.4	
	8/9	6.9	32		39		1.9	53		-		6.4	
	8/10	7.2	33		39		2.5	44		0.8		2.5	
	Mean	-	33	2,975	38	3,427	-	52	4,689	3.3	298	3.0	271
48.1	8/6	7.7	34		44		5.4	58		4.4		2.4	
	8/7	7.8	35		48		3.6	51		3.6		2.7	
cfs = 58.9	8/8	6.7	34		39		1.5	62		6.8		3.2	
	8/9	7.3	35		45		2.4	64		0.4		4.9	
	8/10	6.7	35		45		2.2	70		2.0		3.7	
	Mean	-	35	11,132	44	13,994	-	61	19,401	3.4	1,081	3.4	1,081
	Confluence West Fork Clear Creek - River Mile 47.1												
45.1	8/6	7.7	31		41		6.3	56		11.6		2.4	
	8/7	7.7	31		43		4.0	59		10.0		2.4	
cfs = 110.0	8/8	7.1	31		43		8.8	60		10.8		2.2	
	8/9	7.4	31		42		11.4	55		13.6		5.6	
	8/10	7.0	41		41		9.9	80		9.6		3.7	
	Mean	-	33	19,602	42	24,948	-	62	36,828	11.1	6,593	3.3	1,960
	Argo Mine Drain Discharge - River Mile 36.8												
35.7	8/6	7.7	25		41		7.3	60		18.0		2.4	
	8/7	7.7	26		45		7.2	75		13.6		2.9	
cfs = 129.8	8/8	6.7	28		44		6.0	72		20.4		3.2	
	8/9	7.0	27		44		6.5	75		10.0		7.6	
	8/10	6.9	27		45		6.2	88		14.5		4.2	
	Mean	-	27	18,924	44	30,840	-	74	51,868	15.3	10,724	4.1	2,874
	Confluence North Clear Creek - River Mile 30.0												
26.6	8/6	7.8	25		46		11.4	74		20.4		2.2	
	8/7	7.5	22		47		11.3	67		13.6		2.9	
cfs = 133.2	8/8	6.9	26		47		6.5	112		15.6		2.4	
	8/9	8.0	25		49		8.8	86		10.8		5.4	
	8/10	6.8	26		47		5.6	96		10.0		5.2	
	Mean	-	25	17,982	48	34,525	-	87	62,577	14.1	10,142	3.6	2,589

Table A-7. CHEMICAL ANALYTICAL RESULTS, TRIBUTARIES OF CLEAR CREEK, COLORADO, AUGUST 1966

Station (River Miles) Flow in cfs	Date	pH Units	Alkalinity mg/l	Alkalinity lbs/day	Hardness mg/l	Hardness lbs/day	Turbidity Units	Total Dissolved Solids mg/l	Total Dissolved Solids lbs/day	Total Suspended Solids mg/l	Total Suspended Solids lbs/day	Volatile mg/l	Volatile lbs/day
SOUTH FORK OF CLEAR CREEK													
0.6	8/6	7.7	17		90		1.1	30		1.2		2.4	
	8/7	7.6	19		79		1.0	4		1.2		1.	
cfs = 11.1	8/8	6.6	14		1		2.2	2		16.4		2.	
	8/9	[illegible]	14		24		1.5	40		-		1.	
	8/10	6.	15		1		1.2	31		0.4		1.2	
	Mean	-	14	[illegible]	19	1,170	-	45	2,960	4.3	329	[illegible]	142
	Confluence Woods Creek - River Mile 0.6												
1.0	8/6	7.	22		88		10.6	35		11.6		2.4	
	8/7	7.	21		30		8.2	47		4.4		2.4	
cfs = 24.1	8/8	6.	22		27		6.7	44		8.0		2.4	
	8/9	7.3	22		29		7.2	66		7.6		[illegible]	
	8/10	6.8	22		25		7.8	67		4.8		4.0	
	Mean	-	22	2,021	28	3,04	-	51	6,47	7.4	979	3.	483
UNION													
1.4	8/6	7.	24		33		4.9	43		4.8		2.4	
	8/7	7.6	29		34		4.3	47		3.6		2.0	
cfs = 9.1	8/	6.9	29		34		8.8	53		26.2		3.4	
	8/9	7.7	30		36		7.5	5		8.0		6.4	
	8/10	7.0	21		37		3.6	70		3.6		3.0	
	Mean	-	27	441	35	586	-	54	904	9.0	151	3.4	57
	URAD Mine Drain Discharge - River Mile 1.8												
	Confluence Ruby Creek - River Mile 0.2												
0.1	8/6	7.7	24		36		16.7	42		10.8		4.3	
	8/7	7.7	24		28		17.0	60		10.		2.	
cfs = 7.3	8/8	6.9	26		37		10.5	53		12.0		2.4	
	8/9	7.0	25		36		10.5	61		7.6		5.9	
	8/10	6.9	24		37		18.6	176		8.4		3.	
	Mean	-	25	966	35	1,379	-	78	3,074	11.6	457	4.1	160
RUBY CREEK													
0.1	8/6	6.8	23		25		0.9	78		7.6		2.1	
	8/9	7.5	24		26		1.8	39		4.2		4.6	
cfs = 5.3	8/10	6.8	23		25		2.0	47		3.6		5.0	
	Mean	-	23	658	25	715	-	55	1,574	5.3	152	3.6	103
URAD MINE DRAIN													
	8/6	6.4	17		149		158.0	422		118.8		60.2	
cfs = 0.5	8/7	6.4	20		127		105.0	406		45.2		59.5	
	8/8	6.1	30		167		125.0	422		18.4		63.2	
	8/9	6.5	27		155		130.0	554		559.2		5.9	
	8/10	6.2	33		166		75.0	433		95.6		57.2	
	Mean	-	25	67	153	413	-	527	1,423	167.4	4,520	49.2	1,328
AGMO MINE DRAIN													
cfs = 0.33	8/7	2.7	0	0	289	501	125.6	3,005	5,384	15.2	871	785.0	1,091
NORTH CLEAR CREEK													
0.1	8/6	7.4	5		116		136.0	201		49.2		5.6	
	8/7	6.1	5		130		53.0	271		48.4		6.3	
cfs = 3.5	8/8	5.3	2		137		26.8	244		27.6		10.3	
	8/9	5.3	1		139		40.0	251		36.8		13.7	
	8/10	5.9	1		132		45.0	284		42.6		11.4	
	Mean	-	3	57	131	2,475	-	250	4,785	41.0	775	9.9	187

Table 46. HEAVY METALS, CLEAR CREEK, COLORADO, AUGUST 1966

Station (River Miles) Flow in cfs	Date	Iron mg/l	Iron lbs/day	Aluminum mg/l	Aluminum lbs/day	Manganese mg/l	Manganese lbs/day	Zinc mg/l	Zinc lbs/day	Copper mg/l	Copper lbs/day	Lead mg/l	Lead lbs/day
54.9	8/6	0.2		0.5		<0.1		<0.03		<0.02		-	
	8/7	0.2		<0.5		<0.1		<0.02		<0.02		-	
cfs = 16.7	8/8	0.2		<0.5		0.2		0.03		<0.02		-	
	8/9	0.2		<0.5		<0.1		0.03		<0.02		0.01	
	8/10	0.2		<0.5		<0.1		0.03		<0.02		-	
	Mean	0.2	18	<0.5	<45	<0.1	<9	<0.03	<3	<0.02	<2	-	0.9
48.1	8/6	0.2		<0.5		<0.1		0.28		0.02		-	
	8/7	0.2		0.5		<0.1		0.31		<0.02		0.04	
cfs = 58.9	8/8	0.2		<0.5		0.1		0.30		<0.02		-	
	8/9	0.2		<0.5		<0.1		0.26		<0.02		-	
	8/10	0.2		<0.5		<0.1		0.26		<0.02		-	
	Mean	0.2	64	<0.5	<159	<0.1	<32	0.29	89	<0.02	<6	-	12.7
	Confluence West Fork Clear Creek - River Mile 47.1												
45.1	8/6	0.6		0.6		0.5		0.17		<0.02		-	
	8/7	0.5		<0.5		0.3		0.23		<0.02		-	
cfs = 110.0	8/8	0.6		0.5		0.2		0.23		<0.02		0.09	
	8/9	-		-		-		-		-		-	
	8/10	0.6		0.6		0.3		0.22		0.02		0.03	
	Mean	0.6	356	<0.6	<356	0.3	178	0.21	125	<0.02	<12	0.05	29.7
	Argo Mine Drain Discharge - River Mile 36.8												
35.7	8/6	1.2		0.5		0.3		0.32		0.04		-	
	8/7	1.2		<0.5		0.6		0.34		0.04		0.02	
cfs = 129.8	8/8	1.3		0.5		0.6		0.34		0.04		-	
	8/9	1.1		<0.5		0.6		0.34		0.02		0.04	
	8/10	1.2		0.5		0.6		0.32		0.04		-	
	Mean	1.2	841	<0.5	<350	0.5	350	0.33	231	0.04	28	0.03	21.0
	Confluence North Clear Creek - River Mile 30.0												
26.6	8/6	1.5		0.8		0.6		0.33		<0.02		-	
	8/7	1.3		0.5		0.6		0.33		0.05		-	
cfs = 133.2	8/8	1.6		<0.5		0.6		0.34		<0.02		-	
	8/9	1.9		0.5		0.7		0.39		0.04		0.04	
	8/10	1.3		0.6		0.6		0.31		0.02		0.05	
	Mean	1.5	1079	<0.6	<431	0.6	431	0.34	245	<0.03	<22	0.05	36.0

CHROMIUM - All samples less than 0.05 mg/l
MOLYBDENUM - All samples less than 0.5 mg/l
ARSENIC - All samples less than 0.006 mg/l

Table 47. HEAVY METALS, TRIBUTARIES OF CLEAR CREEK, COLORADO, AUGUST, 1966

Station (River Miles) Flow in cfs	Date	Iron mg/l	Iron lbs/day	Aluminum mg/l	Aluminum lbs/day	Manganese mg/l	Manganese lbs/day	Zinc mg/l	Zinc lbs/day	Copper mg/l	Copper lbs/day	Lead mg/l	Lead lbs/day
WEST FORK OF CLEAR CREEK													
9.6	8/6	0.2		0.5		< 0.1		0.05		< 0.02		-	
	8/7	0.2		< 0.5		0.1		0.03		< 0.02		-	
cfs = 11.5	8/8	0.2		< 0.5		0.3		0.04		< 0.02		-	
	8/9	0.2		< 0.5		0.2		0.05		< 0.02		< 0.01	
	8/10	< 0.1		< 0.5		0.2		0.02		< 0.02		-	
	Mean	< 0.2	< 12	< 0.5	< 31	< 0.2	< 12	.03	2	< 0.02	< 1	-	< 0.6
	Confluence Woods Creek - River Mile 9.4												
5.4	8/6	0.2		< 0.5		< 0.1		0.05		< 0.02		-	
	8/7	0.4		< 0.5		0.8		0.08		< 0.02		-	
cfs = 24.5	8/8	0.4		0.5		0.9		0.08		0.02		< 0.01	
	8/9	0.3		0.5		0.8		0.06		< 0.02		-	
	8/10	-		-		-		-		-		-	
	Mean	0.3	40	< 0.5	66	< 0.7	< 93	0.07	10	< 0.02	< 3	-	< 1.3
WOODS CREEK													
1.4	8/6	-		-		-		-		-		-	
	8/7	0.2		< 0.5		0.1		< 0.02		< 0.02		-	
cfs = 3.1	8/8	0.2		< 0.5		0.1		< 0.02		< 0.02		-	
	8/9	0.4		< 0.5		0.2		< 0.02		< 0.02		< 0.01	
	8/10	< 0.1		< 0.5		0.2		< 0.02		< 0.02		-	
	Mean	< 0.2	< 3	< 0.5	< 8	0.2	3	< 0.02	< 1	< 0.02	< 1	< 0.01	< 0.2
	URAD Mine Drain Discharge - River Mile 1.2												
	Confluence Ruby Creek - River Mile 0.2												
0.1	8/6	-		-		-		-		-		-	
	8/7	0.7		0.5		0.8		0.09		< 0.02		-	
cfs = 7.3	8/8	1.0		1.0		1.4		0.15		< 0.02		0.01	
	8/9	0.7		0.8		1.4		0.12		< 0.02		-	
	8/10	0.7		0.5		1.5		0.14		< 0.02		< 0.01	
	Mean	0.8	32	0.7	27	1.3	51	0.13	5	< 0.02	< 1	< 0.01	< 0.4
RUBY CREEK													
0.1	8/8	0.1		< 0.5		< 0.1		< 0.02		< 0.02		< 0.01	
	8/9	< 0.1		< 0.5		< 0.1		< 0.02		< 0.02		-	
cfs = 5.3	8/10	0.2		< 0.5		< 0.1		< 0.02		< 0.02		0.02	
	Mean	< 0.1	< 3	< 0.5	< 14	< 0.1	< 3	< 0.02	< 1	< 0.02	< 1	< 0.02	< 0.5
URAD MINE DRAIN													
	8/6	13.4		4.8		47.0		4.60		0.05		-	
	8/7	13.2		4.6		43.0		4.40		0.03		-	
cfs = 0.5	8/8	17.0		13.0		43.0		4.80		0.09		-	
	8/9	12.0		13.5		40.0		4.20		0.10		0.04	
	8/10	12.5		5.7		32.0		-		0.07		-	
	Mean	13.6	38	8.3	22	41.0	111	4.50	12	0.07	2	-	< 0.1
ARGO MINE DRAIN													
cfs = 0.33	8/8	160.0	285	20.5	36	85.0	151	46.5	83	5.69	10	0.02	< 0.1
NORTH CLEAR CREEK													
0.1	8/6	6.8		1.0		2.8		1.23		0.07		-	-
	8/7	7.0		0.9		3.2		1.56		0.11		-	-
cfs = 3.5	8/8	5.6		0.5		3.5		1.70		0.08		-	-
	8/9	8.8		1.1		3.2		1.70		0.12		0.02	-
	8/10	9.4		1.1		3.4		1.60		0.12		-	-
	Mean	7.5	142	0.9	17	3.2	60	1.56	29	0.10	2	-	0.6

CHROMIUM = All samples less than 0.05 mg/l.

MOLYBDENUM = All samples less than 0.5 mg/l.

ARSENIC = All samples less than 0.006 mg/l.

Table 48. NITROGEN AND PHOSPHORUS DATA, CLEAR CREEK, COLORADO, AUGUST 1966

Station (River Miles) Flow in cfs	Date	Ammonia Nitrogen µg/l	Ammonia Nitrogen lbs/day	Nitrate Nitrogen µg/l	Nitrate Nitrogen lbs/day	Total Inorganic Nitrogen µg/l	Total Inorganic Nitrogen lbs/day	Organic Nitrogen µg/l	Organic Nitrogen lbs/day	Total Nitrogen µg/l	Total Nitrogen lbs/day	Total Phosphorus µg/l	Total Phosphorus lbs/day	Soluble Phosphorus µg/l	Soluble Phosphorus lbs/day
[illegible]	[illegible]/6	< 10		200				100				< [illegible]		< [illegible]	
	8/7	10		200				200				< [illegible]		< [illegible]	
cfs = 16.7	8/8	< 10		200				< 100				< [illegible]		< [illegible]	
	/9	< 10		200				200				-		< [illegible]	
C-[illegible]0	[illegible]/10	10		200				< 100				< [illegible]		-	
	Mean	< 10	< 0.9	200	18	< 210	< 19	< 140	< 13	< 350	< 32	< [illegible]	< 0.5	< [illegible]	< 0.5
4[illegible].1	[illegible]/6	< 10		100				100				21		-	
	/7	< 10		200				300				23		< [illegible]	
cfs = [illegible].9	8/8	< 10		200				< 100				18		< [illegible]	
	8/9	< 10		-				-				-		< [illegible]	
C-[illegible]4	[illegible]/10	< 10		100				< 100				28		[illegible]	
	Mean	< 10	< 3.2	140	< 46	< 160	< 51	< 150	< 48	< 310	< 99	28	8.9	< 5	< 1.6
	Confluence West Fork of Clear Creek - River Mile 47.1														
[illegible]7.1	[illegible]/6	20		100				300				19		6	
	8/7	< 10		200				100				5		< [illegible]	
cfs = 110.0	8/8	10		200				200				23		< [illegible]	
	/9	10		100				200				16		< [illegible]	
C-59	[illegible]/10	20		100				< 100				10		< [illegible]	
	Mean	< 14	< 8.3	140	83	< 154	< 91	< 180	< 107	< 334	< 198	1[illegible]	8.9	< 5	< 3.0
	Argo Mine Drain Discharge - River Mile 36.8														
3[illegible].7	[illegible]/6	-		-				-				-		< [illegible]	
	8/7	70		100				300				45		< [illegible]	
cfs = 129.8	8/8	120		200				200				52		< [illegible]	
	/9	90		100				100				1[illegible]		< [illegible]	
C-63	[illegible]/10	80		100				100				3[illegible]		10	
	Mean	90	63.1	125	88	215	151	175	122.7	390	274	40	28.0	< 7	< 4.9
	Confluence North Clear Creek - River Mile 30.0														
26.6	[illegible]/6	10		100				200				25		15	
	8/7	10		200				200				24		< [illegible]	
cfs = 133.2	8/8	19		200				200				23		< [illegible]	
	8/9	80		100				300				52		< [illegible]	
C-73	[illegible]/10	40		100				100				23		< [illegible]	
	Mean	32	23.0	140	101	172	124	220	158	392	282	29	20.9	< 7	< [illegible].0

TABLE 46.

NITROGEN AND PHOSPHORUS DATA
TRIBUTARIES OF CLEAR CREEK, COLORADO

August, 1966

Station (River Mile) Flow in cfs	Date	Ammonia Nitrogen		Nitrate Nitrogen		Total Inorganic Nitrogen		Organic Nitrogen		Total Nitrogen		Total Phosphorus		Soluble Phosphorus	
		ug/l	lbs/day	ug/l	lbs/day	ug/l	lbs/day	ug/l	lbs/day	ug/l	lbs/day	ug/l	lbs/day	ug/l	lbs/day
West Fork of Clear Creek															
9.6	8/6	<10		<100				<100				< 5		< 5	
cfs = 11.5	7	<10		<100				100				< 5		< 5	
W56	8	20		<100				100				12		< 5	
	9	-		<100				<100				-		< 5	
	10	<10		<100				<100				< 5		< 5	
	Mean	<13	<0.8	<100	< 6	<113	< 7	<100	< 6	<213	<13	< 7	<0.4	< 5	<0.3
	Confluence Woods Creek - River Mile 9.4														
5.4	8/6	<10		<100				<100				< 5		< 5	
cfs = 26.5	7	<10		100				100				< 5		< 5	
W56A	8	<10		<100				200				< 5		-	
	9	<10		<100				200				< 5		-	
	10	<10		<100				<100				6		5	
	Mean	<10	<1.3	<100	<13	<110	<15	<140	<18	<250	<33	< 5	<0.6	< 5	<0.6
Woods Creek															
1.4	8/6	-		-				-				-		< 5	
cfs = 3.1	7	<10		<100				300				10		-	
	8	<10		<100				100				< 5		-	
	9	<10		<100				400				6		< 5	
	10	10		<100				200				< 5		< 5	
	Mean	<10	<0.2	<100	< 2	<110	< 2	285	< 4	<335	< 6	< 7	<0.1	< 5	<0.1
	Urad Mine Drain Discharge - River Mile 1.2 Confluence Ruby Creek - River Mile 0.2														
0.1	8/6	30		<100				100				< 5		10	
cfs = 7.3	7	30		200				100				11		< 5	
W57	8	<10		200				200				8		5	
		<10		200				200				< 5		< 5	
		60		200				<100				10		< 5	
	Mean	<26	<1.0	<180	< 7	<206	< 8	<120	< 5	<326	<13	< 9	<0.4	< 6	<0.2
Ruby Creek															
0.1	8/8	<10		200				100				< 5		-	
cfs = 5.3	9	<10		200				-							
	10	<10		200				<100				< 5		< 5	
	Mean	<10	<0.3	200	< 6	<210	< 6	<100	< 3	<310	< 9	< 5	<0.1	< 5	<0.1
Urad Mine Drain															
cfs = 0.5	8/6	330		1400				1500				47		< 5	
	7	440		700				100				-		< 5	
	8	420		1300				800				145		< 5	
	9	470		1800				800				140		-	
	10	430		500				400				94		23	
	Mean	418	1.1	1140	3	1558	4	720	2	2278	6	89	0.2	410	<0.1
Argo Mine Drain															
cfs = 0.33	8/7	290		100				200				111		< 5	
	8	80		1000				500				100		< 5	
	Mean	185	0.3	550	1	735	1	350	1	1085	2	106	0.2	< 5	<0.1
North Clear Creek															
0.1	8/6	290		200				200				83		< 5	
cfs = 3.5	7	300		200				400				152		< 5	
N.C. 64	8	290		200				200				52		< 5	
	9	-		-				-				45		< 5	
	10	420		200				400				140		< 5	
	Mean	308	5.8	200	4	508	10	300	6	808	15	94	1.8	< 5	<0.1

Table 50. SUMMARY OF ANALYSES OF PERIPHYTON FROM GLASS-SLIDE SUBSTRATES, CLEAR CREEK AND TRIBUTARIES, AUGUST, 1966

(10 Days Exposure)

Station (River Miles)	Chlorophyll Micrograms/Sq. Inch	Diatoms Number/Sq. Inch	All Algae Number/Sq. Inch	Predominant Kind(s)
CLEAR CREEK				
54.9	< 0.25	88,900	91,100	None Predominant
48.1	1.70	188,900	147,800	Achnanthes
45.1	6.91	253,200	260,000	Achnanthes
35.7	5.34	77,800	82,200	Achnanthes
26.6	< 0.26	79,900	86,600	Achnanthes
WEST FORK CLEAR CREEK				
9.6	0.92	60,850	62,200	Ceratoneis, Ulothrix
5.4	1.35	339,800	342,200	Achnanthes
WOODS CREEK				
1.4	< 0.43	149,000	151,100	Synedra, Tabellaria
NORTH CLEAR CREEK	< 0.29	< 100	< 100	None Predominant

TABLE 51.

BOTTOM ANIMALS, CLEAR CREEK (HEADWATERS TO GOLDEN) AND TRIBUTARIES, COLORADO
AUGUST 1966

(Number per Square Foot)

Station (River Mile)⟶	Clear Creek 54.9	48.2	45.1	35.7	26.6	North Clear Creek 0.1	West Clear Creek 9.6	5.4	Woods Creek 1.4	0.1
STONEFLIES (PLECOPTERA)										
Nemoura	17	4	-	1	-	-	2	2	-	Q
Leuctra	-	-	-	-	-	-	6	-	-	-
Brachyptera	-	-	-	1	-	-	-	-	-	-
Arcynopteryx	-	-	-	-	1	-	-	-	-	-
Alloperla	-	-	Q	-	-	-	-	-	-	-
MAYFLIES (EPHEMEROPTERA)										
Ironopsis	19	9	2	-	-	-	23	2	-	1
Cinygmula	3	-	1	-	-	-	-	-	-	-
Pseudocloeon	15	13	6	1	-	-	5	2	-	1
Ephemerella	1	16	-	-	-	-	3	5	-	-
Baetis	-	37	3	4	16	1	-	-	-	-
CADDISFLIES (TRICOPTERA)										
Arctopsyche	-	12	39	5	38	9	-	-	-	-
Glossosoma	-	5	-	-	-	-	1	2	-	-
Neureclipsis	-	-	10	13	-	-	-	-	-	-
Agraylea	-	-	-	1	-	-	-	-	-	-
Chrematopsyche	-	-	-	-	14	90	-	-	-	-
RIFFLE BEETLES (ELMIDAE)										
Optioservus	-	-	1	-	-	1	-	-	-	Q
Agabus	-	-	-	-	-	-	-	-	-	-
SNIPE FLIES (RHAGIONIDAE)										
Atherix	-	-	-	-	3	-	-	-	-	-
CRANE FLIES (TIPULIDAE)	-	-	-	-	-	-	-	1	-	-
DANCE FLIES (EMPIDIDAE)	-	1	-	-	-	-	-	-	-	-
BLACK FLIES (SIMULIDAE)	Q	-	-	-	-	-	-	-	-	2
MIDGES (CHIRONOMIDAE)										
Prodiamesa	-	42	4	-	-	-	-	-	5	-
Cricotopus	-	82	36	-	14	-	8	140	7	-
Brillia	-	5	5	-	83	5	-	-	5	-
Spaniotoma	-	20	-	29	-	2	2	91	25	-
Polypedilum	-	-	-	-	4	-	-	-	-	-
MOTH FLIES (PSYCHODIDAE)	-	-	-	24	-	-	-	-	-	-
SLUDGE WORMS (TUBIFICIDAE)	33	6	1	-	-	-	5	-	15	-
Number of Kinds	7	13	12	9	8	6	9	8	5	5
Number per square foot	89	249	109	79	173	108	55	245	57	6

Q = Organisms not collected quantitatively; arbitrarily given value of one for computing.

TABLE 52.

SUMMARY OF FISH CAPTURED IN TEST NETS,

CLEAR CREEK AND WEST CLEAR CREEK, COLORADO, AUGUST, 1966

(Total for 4 Net Days or Equivalent) (Weight in Grams)

	Clear Creek, Station (River Mile)									
	54.9		48.1		45.1		35.7		26.6	
Species	number	weight	number	weight	number	weight	number	weight	number	weight
Brook	4	380	4	463						
Rainbow			1	268						
Long-Nose Sucker			1	151					1	77
Total	4	380	6	882	0	0	0	0	1	77

	West Clear Creek, Station (River Mile)			
	9.6		5.4	
	number	weight	number	weight
Cut-Throat Trout	2	352		
Brook Trout			5	566
Total	2	352	5	566

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TABLE 5%. CHEMICAL AND BIOLOGICAL RESULTS, MOSQUITO CREEK, SOUTH FORK OF MOSQUITO CREEK, AND MIDDLE FORK OF SOUTH PLATTE RIVER, COLORADO, JULY AND AUGUST, 19[illegible]

Station (River Miles)	Date	pH Units	Alkalinity mg/l	Hardness mg/l	Turbidity Units	Total Dissolved Solids mg/l	Total Suspended Solids mg/l	Acidity mg/l
MOSQUITO CREEK								
[illegible].0	7/28	[illegible]	2	22	0.6	17	1.2	[illegible]
	7/29	[illegible]	21	23	1.3	26	.6	2.0
	7/30	.1	20	21	0.6	24	3.2	[illegible]
	7/31	.1	20	21	1.0	29	[illegible]	[illegible]
	8/1	[illegible]	20	21	2.0	23	[illegible]	2.
	Mean	-	1	22	-	20	[illegible]	1.9
[illegible].1	7/28	.1	34	40	0.9	41	3.2	1.2
	7/29	[illegible]	[illegible]	40	1.3	[illegible]	2.4	[illegible]
	7/30	[illegible]	39	39	0.	[illegible]	3.6	2.[illegible]
	7/31	.0	[illegible]	40	0.[illegible]	[illegible]	[illegible]	[illegible]
	8/1	[illegible]	[illegible]	47	4.[illegible]	[illegible]	[illegible]	2.2
	Mean	-	[illegible]	41	-	[illegible]	[illegible]	[illegible]
	Confluence of [illegible] South Fork & Mosquito Creek - River Mile [illegible].0							
4.1	7/28	.0	[illegible]	102	[illegible]	[illegible]	[illegible]	2.2
	7/29	[illegible]	[illegible]	73	[illegible]	111	[illegible]	2.0
	7/30	[illegible]	[illegible]	66	[illegible]	[illegible]	[illegible]	[illegible]
	7/31	.0	[illegible]	74	4.0	92	[illegible]	[illegible]
	8/1	.2	[illegible]	70	14.2	[illegible]	[illegible]	2.2
	Mean	-	[illegible]	83	-	[illegible]	[illegible]	[illegible]
[illegible].6	7/28	.0	[illegible]	60	4.0	[illegible]	[illegible]	[illegible]
	7/29	.0	[illegible]	70	[illegible]	[illegible]	[illegible]	[illegible]
	7/30	.0	[illegible]	66	4.6	[illegible]	[illegible]	[illegible]
	7/31	[illegible]	[illegible]	81	[illegible]	[illegible]	[illegible]	[illegible]
	8/1	[illegible]	[illegible]	84	[illegible]	[illegible]	[illegible]	[illegible]
	Mean	-	61	74	-	109	[illegible]	[illegible]
0.1	7/28	[illegible]	[illegible]	91	2.3	107	[illegible]	[illegible]
	7/29	[illegible]	[illegible]	93	2.6	63	4.4	2.2
	7/30	[illegible]	[illegible]	93	2.6	104	[illegible]	3.4
	7/31	[illegible]	[illegible]	94	3.8	120	[illegible]	2.0
	8/1	[illegible]	[illegible]	97	2.8	150	-	[illegible]
	Mean	-	70	94	-	109	4.1	2.1
SOUTH FORK MOSQUITO CREEK								
1.2A	7/28	8.0	53	65	0.6	[illegible]	[illegible]	1.7
	7/29	[illegible]	53	64	0.3	14	4.0	[illegible]
	7/30	[illegible]	[illegible]	65	0.3	[illegible]	[illegible]	3.2
	7/31	[illegible]	64	76	1.3	90	[illegible]	[illegible]
	8/1	[illegible]	60	66	0.9	104	[illegible]	[illegible]
	Mean	-	57	67	-	71	[illegible]	2.6
1.2B	7/28	8.0	66	82	0.2	95	[illegible]	[illegible]
	7/29	[illegible]	68	84	0.6	96	2.0	1.2
	7/30	[illegible]	70	85	0.6	79	[illegible]	[illegible]
	7/31	[illegible]	70	88	0.6	95	[illegible]	[illegible]
	8/1	[illegible]	70	85	0.9	118	0.4	[illegible]
	Mean	-	69	85	-	97	[illegible]	[illegible]
0.1	7/28	[illegible]	[illegible]	117	[illegible]	166	[illegible]	[illegible]
	7/29	[illegible]	[illegible]	118	[illegible]	109	[illegible]	[illegible]
	7/30	[illegible]	[illegible]	118	[illegible]	140	[illegible]	[illegible]
	7/31	[illegible]	[illegible]	121	[illegible]	164	[illegible]	[illegible]
	8/1	[illegible]	[illegible]	146	[illegible]	210	[illegible]	[illegible]
	Mean	-	[illegible]	134	-	158	[illegible]	[illegible]
MIDDLE FORK SOUTH PLATTE RIVER								
33.8	7/28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8/1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Mean	-	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]
	Confluence of Mosquito Creek - River Mile 38.9							
31.7	7/28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8/1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Mean	-	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]
London Mine Drain	7/28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7/31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8/1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Mean	-	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]

TABLE 14. HEAVY METALS, MOSQUITO CREEK, SOUTH FORK OF MOSQUITO CREEK, AND MIDDLE FORK OF SOUTH PLATTE RIVER, COLORADO, JULY AND AUGUST 1966 (MILLIGRAMS PER LITER)

Station (River Miles)	Date	Iron	Aluminum	Manganese	Zinc	Copper	Lead
MOSQUITO CREEK							
7.0	7/28	<0.1	<0.5	<0.1	0.02	<0.02	0.01
	7/29	0.2	<0.5	0.1	<0.02	<0.02	-
	7/30	<0.1	<0.5	<0.1	<0.02	<0.02	-
	7/31	<0.1	<0.5	<0.1	<0.02	<0.02	-
	8/1	<0.1	<0.5	<0.1	0.02	<0.02	<0.01
	Mean	<0.1	<0.5	<0.1	<0.02	<0.02	<0.01
5.1	7/28	<0.1	<0.5	<0.1	0.02	<0.02	0.02
	7/29	<0.1	<0.5	<0.1	0.02	<0.02	-
	7/30	0.2	<0.5	<0.1	<0.02	<0.02	-
	7/31	0.0	<0.5	<0.1	0.02	<0.02	-
	8/1	0.4	0.5	<0.1	0.07	<0.02	0.05
	Mean	<0.3	<0.5	<0.1	0.03	<0.02	0.03
	Confluence of South Fork of Mosquito Creek - River Mile 5.0						
4.1	7/28	1.0	<0.5	0.2	0.22	<0.02	0.07
	7/29	2.0	0.5	0.4	0.48	0.02	-
	7/30	0.1	<0.5	<0.2	0.17	<0.02	-
	7/31	0.4	<0.5	0.2	0.17	<0.02	-
	8/1	1.9	0.5	0.2	0.34	<0.02	0.10
	Mean	1.1	<0.5	<0.3	0.28	<0.02	0.09
2.0	7/28	0.2	<0.5	0.1	0.15	<0.02	0.06
	7/29	1.4	0.5	0.3	0.12	<0.02	-
	7/30	0.5	<0.5	0.1	0.18	<0.02	-
	7/31	0.6	<0.5	<0.1	0.18	<0.02	-
	8/1	1.4	<0.5	0.2	0.26	<0.02	0.08
	Mean	0.9	<0.5	<0.2	0.18	<0.02	0.07
0.1	7/28	0.4	0.5	<0.1	0.10	<0.02	0.03
	7/29	0.4	<0.5	0.1	0.16	0.02	-
	7/30	0.4	<0.5	0.1	0.13	<0.02	-
	7/31	0.5	<0.5	<0.1	0.13	<0.02	-
	8/1	0.4	<0.5	<0.1	0.13	<0.02	0.03
	Mean	0.4	<0.5	<0.1	0.12	<0.02	0.03
SOUTH FORK MOSQUITO CREEK							
1.2A	7/28	<0.1	<0.5	<0.1	0.03	<0.02	0.02
	7/29	<0.1	<0.5	<0.1	0.04	<0.02	-
	7/30	<0.1	<0.5	<0.1	0.03	<0.02	-
	7/31	0.2	<0.5	<0.1	0.03	<0.02	-
	8/1	0.2	<0.5	<0.1	0.04	<0.02	<0.01
	Mean	<0.2	<0.5	<0.1	0.05	<0.02	<0.02
1.2B	7/28	<0.1	<0.5	<0.1	<0.02	<0.02	0.01
	7/29	<0.1	0.5	<0.1	<0.02	<0.02	-
	7/30	<0.1	<0.5	<0.1	0.19	<0.02	-
	7/31	<0.1	<0.5	<0.1	<0.02	<0.02	-
	8/1	0.2	<0.5	<0.1	<0.02	<0.02	<0.01
	Mean	<0.1	<0.5	<0.1	<0.06	<0.02	<0.01
0.1	7/28	1.8	0.5	0.2	0.62	0.03	0.20
	7/29	1.4	1.0	0.2	0.62	0.02	-
	7/30	1.4	0.8	0.1	0.64	0.02	-
	7/31	2.7	0.9	0.2	0.71	<0.02	-
	8/1	11.0	10.5	0.6	1.93	0.21	1.80
	Mean	3.7	2.7	0.3	0.9	<0.06	1.00
MIDDLE FORK SOUTH PLATTE RIVER							
33.8	7/28	0.1	<0.5	<0.1	<0.02	<0.02	<0.01
	7/29	0.4	<0.5	0.1	0.02	<0.02	-
	7/30	0.2	0.5	<0.1	<0.02	<0.02	-
	7/31	0.2	<0.5	<0.1	0.02	<0.02	-
	8/1	0.3	<0.5	<0.1	<0.02	<0.02	<0.01
	Mean	0.2	<0.5	<0.1	<0.02	<0.02	<0.01
	Confluence of Mosquito Creek - River Mile 32.9						
31.7	7/28	0.7	<0.5	<0.1	0.06	0.02	0.02
	7/29	0.2	<0.5	<0.1	0.03	<0.02	-
	7/30	0.2	<0.5	<0.1	0.03	<0.02	-
	7/31	0.2	<0.5	<0.1	0.03	<0.02	-
	8/1	0.2	<0.5	<0.1	0.04	<0.02	<0.01
	Mean	0.3	<0.5	<0.5	0.04	<0.02	<0.02
London Mine Drain	7/28	4.2	0.8	0.4	4.4	0.08	0.01
	7/29	5.6	<0.5	0.4	4.8	0.10	-
	7/30	6.8	0.8	0.4	4.8	0.14	-
	7/31	0.4	0.5	0.3	4.3	0.08	-
	8/1	0.8	0.7	0.4	4.4	0.12	0.07
	Mean	3.6	<0.7	0.4	4.5	0.10	0.04

CYANIDE - All analysis less than 0.005 mg/l

CHROMIUM - All analysis less than 0.05 mg/l

TABLE 5b. NITROGEN AND PHOSPHORUS DATA, MOSQUITO CREEK, SOUTH FORK OF MOSQUITO CREEK, AND MIDDLE FORK OF SOUTH PLATTE RIVER, COLORADO, JULY AND AUGUST, 1968

(Micrograms per liter)

Station (River Miles) Flow in cfs	Date	Ammonia Nitrogen	Nitrite Nitrogen	Total Inorganic Nitrogen	Organic Nitrogen	Total Nitrogen	Total Phosphate	Ortho Phosphate
MOSQUITO CREEK								
	7/28	-	-	-	-	-	-	-
	7/29	10	< 100	-	200	-	-	-
	7/30	20	< 100	-	300	-	-	-
	7/31	50	< 100	-	300	-	10	-
	8/1	10	< 100	-	200	-	15	< 5
	Mean	20	-	< 103	250	< 353	12	-
1.1	7/28	-	-	-	-	-	-	-
	7/29	< 10	< 100	-	200	-	5	< 5
	7/30	20	< 100	-	200	-	7	< 5
	7/31	200	< 100	-	700	-	5	-
	8/1	40	< 100	-	100	-	15	-
	Mean	< 70	< 100	< 127	92	< 219	-	< 5
	CONFLUENCE OF SOUTH FORK OF MOSQUITO CREEK - RIVER MILE 1.5.0							
4.1	7/28	70	< 100	-	200	-	-	-
	7/29	10	< 100	-	700	-	10	-
	7/30	10	< 100	-	200	-	10	< 5
	7/31	10	< 100	-	400	-	5	< 5
	8/1	< 10	< 100	-	300	-	30	< 5
	Mean	< 21	< 100	< 115	305	< 420	22	< 5
3.1	7/28	20	< 100	-	200	-	< 5	-
	7/29	10	< 100	-	300	-	20	-
	7/30	< 10	< 100	-	300	-	10	< 5
	7/31	< 10	< 100	-	300	-	10	< 5
	8/1	< 10	< 100	-	300	-	20	< 5
	Mean	< 15	< 100	< 115	280	< 395	< 15	< 5
2.1	7/28	10	< 100	-	300	-	10	< 5
	7/29	20	< 100	-	600	-	< 5	-
	7/30	20	< 100	-	200	-	10	< 5
	7/31	20	< 100	-	300	-	10	-
	8/1	< 10	< 100	-	100	-	10	-
	Mean	< 16	< 100	< 116	300	< 416	< 9	< 6
SOUTH FORK OF MOSQUITO CREEK								
1.2A	7/28	-	-	-	-	-	-	-
	7/29	< 10	< 100	-	200	-	5	-
	7/30	10	< 100	-	200	-	10	< 5
	7/31	20	< 100	-	300	-	10	< 5
	8/1	10	< 100	-	300	-	20	5
	Mean	< 13	< 100	< 113	250	< 363	11	< 5
1.2B	7/28	-	< 100	-	300	-	-	-
	7/29	< 10	< 100	-	< 100	-	< 5	-
	7/30	10	< 100	-	400	-	5	< 5
	7/31	10	< 100	-	400	-	10	5
	8/1	10	< 100	-	300	-	15	< 5
	Mean	< 10	< 100	< 110	< 300	< 410	< 9	< 5
0.1	7/28	40	< 100	-	300	-	-	-
	7/29	< 10	100	-	< 100	-	20	-
	7/30	40	< 100	-	200	-	25	< 5
	7/31	30	100	-	200	-	25	< 5
	8/1	10	200	-	600	-	430	< 5
	Mean	< 26	< 120	< 146	< 280	< 426	125	< 5
MIDDLE FORK SOUTH PLATTE RIVER								
33.8	7/28	10	< 100	-	100	-	5	5
	7/29	40	< 100	-	200	-	5	< 5
	7/30	30	< 100	-	200	-	10	< 5
23.5 cfs	7/31	20	< 100	-	100	-	10	7
	8/1	10	< 100	-	300	-	5	< 5
	Mean	22	< 100	< 122	180	< 302	7	< 6
	CONFLUENCE OF MOSQUITO CREEK - River Mile 32.9							
31.7	7/28	< 10	< 100	-	200	-	10	< 5
	7/29	30	< 100	-	300	-	5	7
	7/30	70	< 100	-	200	-	10	< 5
	7/31	20	< 100	-	600	-	10	5
	8/1	10	< 100	-	200	-	10	5
	Mean	< 36	< 100	< 128	260	< 388	9	< 5
London	7/28	10	100	-	200	-	-	-
Mine	7/29	10	200	-	300	-	52	< 5
Drain	7/30	30	200	-	400	-	35	< 5
	7/31	30	< 100	-	< 100	-	30	< 5
	8/1	< 10	100	-	< 100	-	70	40
	Mean	18	< 140	< 158	< 120	< 278	47	< 14

Table 56. SUMMARY OF ANALYSES OF PERIPHYTON FROM GLASS-SLIDE SUBSTRATES, MOSQUITO CREEK AND SOUTH FORK OF MOSQUITO CREEK, JULY-AUGUST, 1966

(10 Days Exposure)

Station (River Miles)	Chlorophyll Micrograms/Sq. Inch	Diatoms Number/Sq. Inch	All Algae Number/Sq. Inch	Predominant Kind(s)
MOSQUITO CREEK				
7.0	5.66	719,400	1,131,100	Ceratoneis, Ulothrix
5.1	0.26	122,200	122,200	Achnanthes
4.1	0.44	75,600	82,200	None Predominant
2.6	< 0.25	82,100	88,800	None Predominant
0.1	0.76	153,300	153,300	Achnanthes
SOUTH FORK MOSQUITO CREEK				
1.2A	1.7	422,300	508,800	Ceratoneis, Schizomeris
1.2B	< 0.26	111,000	111,000	None Predominant
0.1	< 0.13	1,100	6,600	None Predominant

TABLE 57. BOTTOM ANIMALS, MOSQUITO CREEK, SOUTH FORK OF MOSQUITO CREEK AND MIDDLE FORK OF THE SOUTH PLATTE RIVER-JULY 1966

(Number per square foot)

Station (River Miles) ——————>	Mosquito Creek					South Fork Mosquito Creek			Middle Fork South Platte River	
	7.0	5.1	4.[illegible]	2.6	0.1	1.2A	1.2B	0.1	23.8	3.7
STONEFLIES (PLECOPTERA)										
Prachyptera	2	4	1	-	-	17	5	-	3	-
Nemoura	-	5	-	4	-	-	3	-	6	-
Pteronarcys	-	-	1	-	1	-	-	-	-	-
Chloroperlinae	-	-	-	-	-	-	-	-	3	2
Pteronarcella	-	-	-	-	-	-	-	-	2	-
Arcynopteryx	-	-	-	-	-	1	-	-	-	-
MAYFLIES (EPHEMEROPTERA)										
Ephemerella	1	2	-	-	4	27	1	1	4	1
Ironopsis	7	9	-	1	-	2	14	1	14	2
Baetis	-	4	1	-	3	1	-	-	2	5
Rithrogenia	-	-	-	-	-	-	-	-	20	11
Iron	-	-	-	-	-	1	-	-	-	1
Cinygmula	-	-	-	-	-	6	6	-	-	-
CADDISFLIES (TRICOPTERA)										
Psychomyia	2	-	1	2	1	14	3	2	-	-
Rhyacophila	-	-	-	-	-	-	-	-	-	4
Agapetus	-	-	-	-	-	1	-	-	6	-
Arctopsyche	-	-	-	-	-	-	-	-	1	-
RIFFLE BEETLES (ELMIDAE)										
Optioservus	1	-	-	-	-	-	-	-	-	-
BLACK FLIES (SIMULIDAE)										
Prosimulium	-	Q	5	50	Q	2	3	-	3	2
Simulium	-	-	16	81	Q	-	-	-	1	2
HORSEFLIES (TABANIDAE)	-	-	-	-	-	-	1	1	-	-
BITING MIDGES (CERATAPOGONIDAE)										
Bezzia	-	-	-	-	-	-	1	-	-	-
MIDGES (CHIRONOMIDAE)										
Brillia	79	-	8	11	-	54	19	-	4	Q
Cricotopus	37	-	35	2	-	-	9	-	1	-
Spaniotoma	71	-	-	-	4	128	40	1	3	-
Pseudochironomus	10	8	2	2	-	26	7	-	-	-
Prodiamesa	-	-	-	-	-	-	77	9	-	-
SCUDS (AMPHIPODA)	-	-	-	-	-	-	-	-	1	-
SLUDGEWORMS (TUBIFICIDAE)	-	-	-	-	-	1	1	-	-	-
Number of Kinds	9	7	9	8	7	14	15	6	16	11
Number of Animals	210	33	70	153	12	281	193	15	74	26

Q = Organisms not collected quantitatively; arbitrarily given value of one for computing.

TABLE 58.

SUMMARY OF FISH CAPTURED IN TEST-NETS, MOSQUITO CREEK AND MIDDLE FORK OF SOUTH PLATTE RIVER
JULY 1966

(Total for 4 Net Days or Equivalent) (Weights in Grams)

	Mosquito Creek										Middle Fork South Platte River			
Station River Mile ⟶	7.0		5.1		4.1		2.6		0.1		33.8		31.7	
	number	weight	number	weight	number	weight	number	weight	number	weight	number	weight	number	weight
Cutthroat Trout	2	142	0	0	0	0	0	0	0	0	0	0	0	0
Brook Trout	18	1196	0	0	1	26	2	100	0	0	6	95	1	5
Rainbow Trout	0	0	2	88	0	0	0	0	3	160	4	234	4	534
Brown Trout	0	0	0	0	0	0	0	0	1	110	6	346	4	1329
Total Trout	20	1338	2	88	1	26	2	100	4	270	16	329	9	1828
Long-Nose Sucker	0	0	0	0	0	0	0	0	0	0	0	0	9	787
Total All Fish	20	1338	2	88	1	26	2	100	4	270	16	329	18	2615

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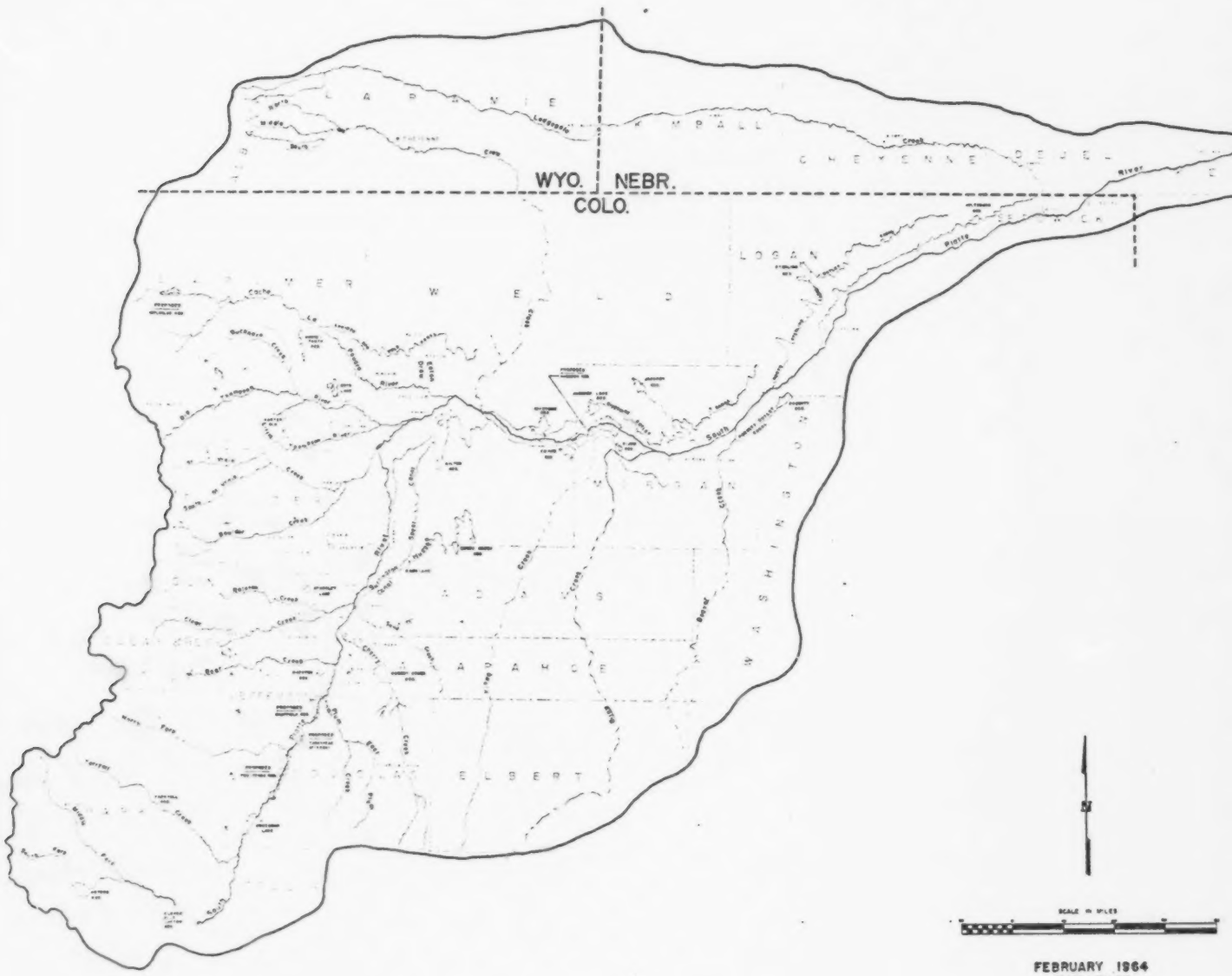

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REVISED AUGUST 1966

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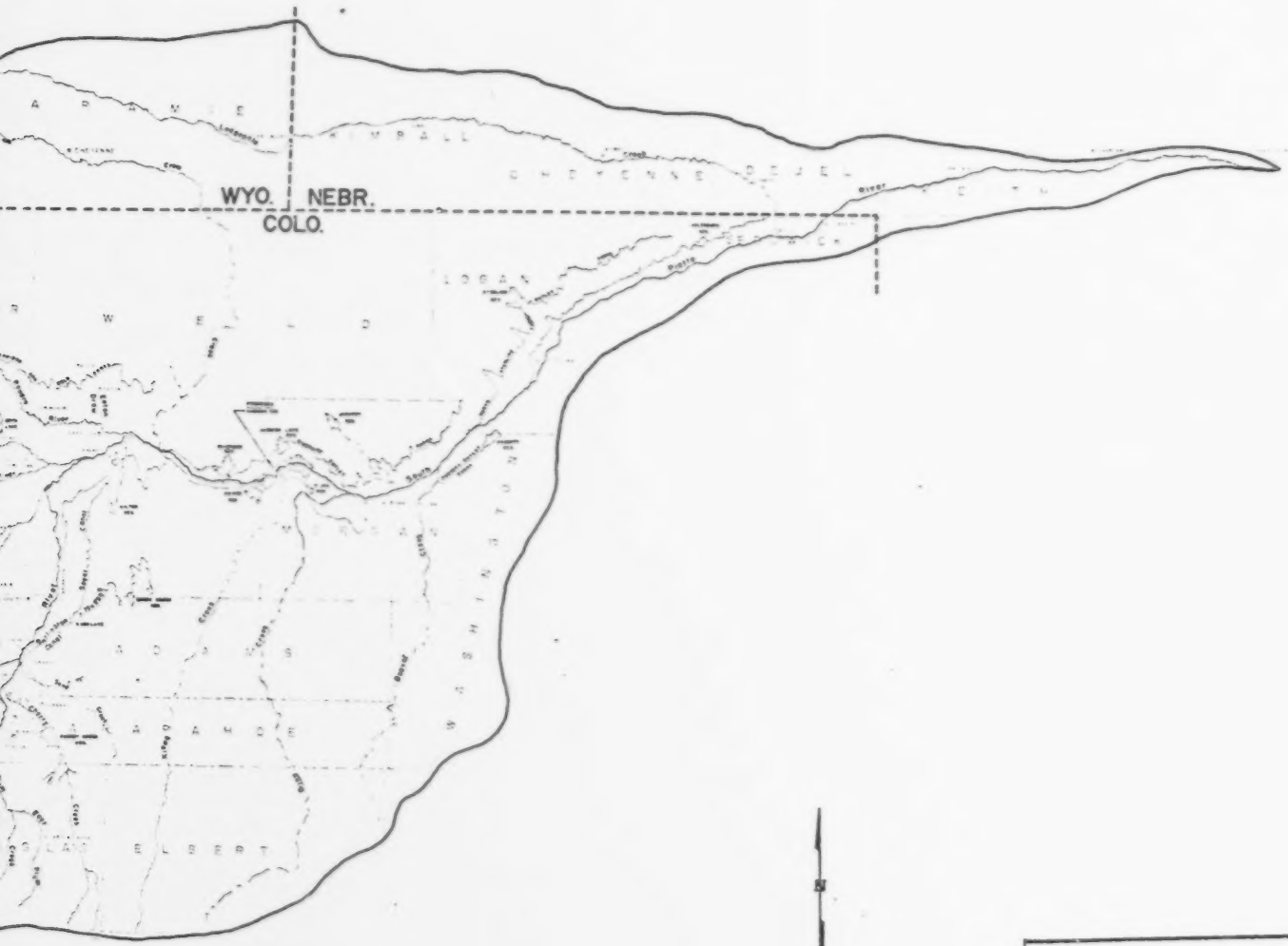

FEBRUARY 1964

SOUTH PLATTE RIVER BASIN

GENERAL MAP

U.S. DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
Denver, Colorado

FIGURE 1

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